APR.
28
1961

PETROLEUM WEEK

A McGRAW-HILL PUBLICATION

Petroleum industry plans a high level of capital expenditures

page 11

Totah-Cha Cha sparks New Mexico play . . 31
Multifuel engines gain favor 40
Automatic field welders save time 44

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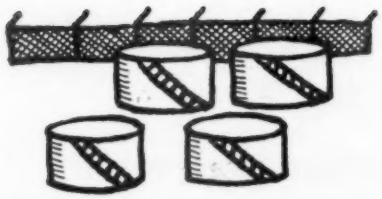

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INSIDE *Slant*

A BOOST FOR ASPHALT

Dean Fred J. Benson, of Texas A.&M.'s engineering school, made a very pertinent point recently in some comments on asphalt.

This, like other secondary products of oil, is a stepchild. In fact, the way some oil people think of it, asphalt might have a hard time proving kinship.

The point that Dean Benson made is that the petroleum industry "has shown little or no interest" in making specialists available to guide the construction industry in asphalt applications.

Here's an area that could be developed, and could result in substantial increases in asphalt consumption.

It goes without saying that anything that results in greater use of oil products—no matter what they are—benefits the entire industry.

Asphalt sales, for all uses, are running around 20-million tons a year at the present.

Paving materials account for the bulk of this. Construction uses could be greater.

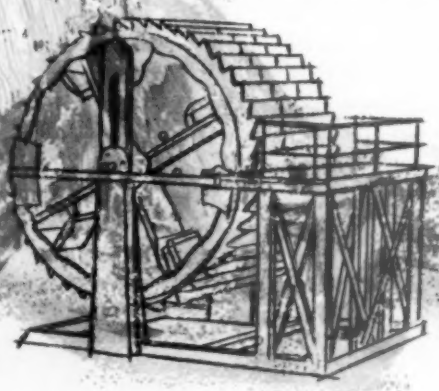
Conceded gasoline is the No. 1 product. But as Dean Benson says, asphalt is important too. The Asphalt Institute has been doing a heroic job—but petroleum can help more than it has in the past.

LeRoy Menzing
Editor

THE QUALITY OF THINKING

From an almost unlimited scope of thought, Leonardo da Vinci brought forth a stream of inventions which — in modern form — are in use today. However, Leonardo's greatest contribution was simply the triumph of creative thought applied to practical results. His work will stand for all time as proof that the appraisal of quality applies to thinking as well as to tangible objects and to visible or audible processes.

In a related sense, the quality of engineering is measured by results. And it is by results alone that the minds responsible for an engineering project can be evaluated. When you check the record of Brown & Root's engineering through the years, the high quality of thinking is self-evident. Customer satisfaction from greater efficiency at lower costs has built a worldwide reputation for engineering and construction by Brown & Root.



This squirrel-cage blower, invented by Leonardo da Vinci and put to practical use, was a significant step toward modern mechanical air conditioning.

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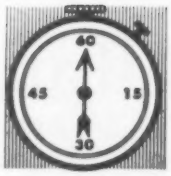
60-Second Summary



THE WEEK'S MOST IMPORTANT DEVELOPMENTS

PETROLEUM WEEK

April 28, 1961

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Petroleum Week Ceases Publication May 5

The next issue of Petroleum Week will be the last. After six years of operations supported by a considerable investment, Petroleum Week is far from a financial success. The outlook does not warrant further investment.

The editors dedicated their efforts to bring to the subscribers the significant news of the petroleum industry in a uniquely concise style. We take pride in the fact that Petroleum Week became the largest petroleum industry publication, with a paid circulation of 47,000.

We appreciate the confidence that oil men placed in Petroleum Week, and sincerely regret that we will no longer be able to serve you.

An appreciable number of advertisers have used and have profited from the advertising pages. Not enough advertisers, however, recognized this type of reporting service as a necessary part of their marketing effort. Unfortunately, not all publications which are genuinely interesting and useful to important readers are equally attractive to advertisers.

There are a considerable number of subscriptions with many months to run. Those of you whom we believe will be benefitted by some of the other McGraw-Hill magazines will be offered an exchange for the unexpired balance of your subscriptions—or a refund.

A drill pipe that's tapered to provide extra strength for vulnerable sections has passed initial field tests. It has been used in 82,000 ft. of hole to date. . . . p. 22

•

Pipeliners have a new cost-cutting, time-saving tool: Automatic field welders. Two such machines have been perfected, and a third should be ready by fall. . . . p. 44

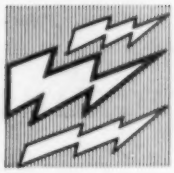
•

Development of liquid multifuel engines is being pushed in the U.S. and Canada. Economy and national security are the principal reasons for the development program. . . . p. 40

•

The petroleum industry plans to boost its capital spending this year by 6.2% to a record of nearly $6.4-billion. Oil's spending plans will run counter to a 1% decline in spending by all business. . . . p. 11

Up to the Minute



SIGNIFICANT LATE NEWS

PETROLEUM WEEK

April 28, 1961

First-quarter earnings reports are the best in history for many oil companies, with gains up to 66% being recorded. Union Oil Co. of California reported earnings of $9.1-million for the first quarter, 66% better than the like period of 1960. Socony Mobil Oil Co.'s first quarter net was $59.8-million, an increase of 27%. Gulf Oil Corp. reported earnings of $95.3-million, a jump of 16.5%, which Gulf ascribed solely to domestic operations. Texaco Inc. said its first quarter net was $108.1-million, up 11.1%, and Continental Oil Co. said its earnings were $16-million, up 5% from the first quarter of 1960. Cities Service Co., Phillips Petroleum Co., and Sunray Mid-Continent Oil Co., also came in with cheerful reports: Cities Service, +14%; Phillips, +7%; and Sunray, +18%. Colorado Oil & Gas Corp. reported a net of $1.1-million, compared with a loss of $179,729 for the first quarter of last year. Texas Pacific Coal and Oil Co. lost ground, however, with a 15% decline in the first quarter.

•

Prices of all distillates, except kerosine, dipped 0.5¢ a gal. in the Gulf Coast spot markets this week. The reductions brought the cargo low price of No. 2 fuel oil down to 8.5¢ a gal., a full cent off the winter peak. The new spot price is 0.5¢ above the year-ago level. The break in prices was not surprising.

Kerosine prices, supported by a strong jet fuel demand, are firm. The "spread" between kerosine and No. 2 fuel now has opened to 1.125¢ a gal., the widest in more than ten years.

•

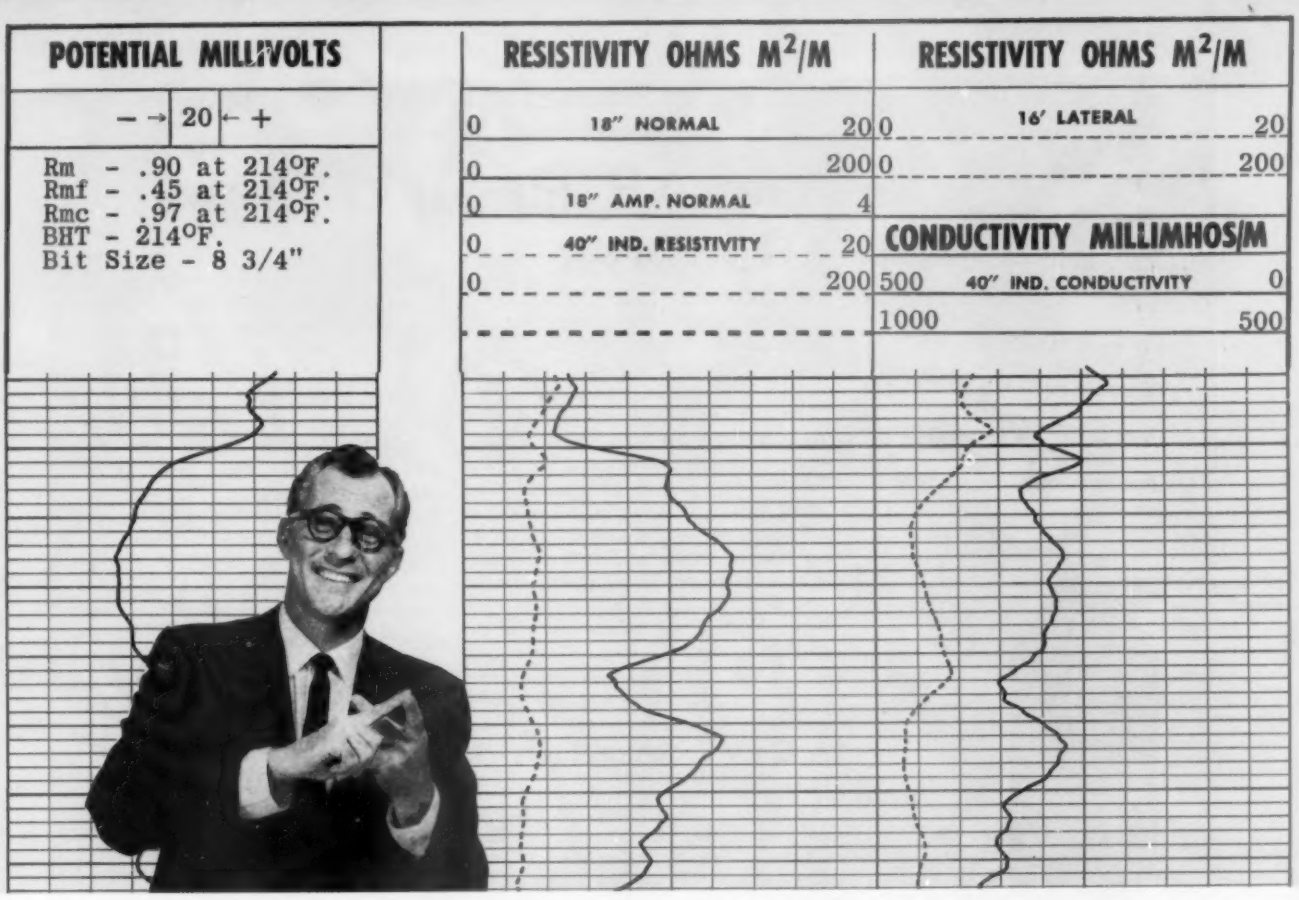
Attorney General Robert F. Kennedy wants antitrust enforcement "strengthened" with premerger notification and "investigative" laws. He asked Congress to work on a stronger premerger notification bill than the one introduced in the House by Rep. Emanuel Celler (D., N. Y.). He also recommended revisions in a civil investigative demand measure, already introduced by Sen. Estes Kefauver (D., Tenn.), that would empower the Justice Dept. to compel firms to turn over records believed "pertinent" to antitrust investigations.

•

Lawrence J. O'Connor, Jr., will continue in his post as Oil Import Administrator, Interior Secretary Stewart L. Udall decided this week. O'Connor, who served previously as assistant director of Interior's Office of Oil & Gas, took over the import post last July when Capt. M. V. Carson, Jr., resigned.

•

Efforts of foreign oil producing nations to set petroleum prices are doomed to failure, an Arabian American Oil Co. official predicted this week. George W. Ray, Jr., Aramco's general counsel, said that "prices are made in the market place, and the buyer has as much to say about what the price of oil will be as the seller." The makers of oil prices, he added, "should be free of all political pressures, a freedom impossible of attainment by the politician." He conceded that oil prices "probably will become enmeshed in politics whether one likes it or not."



Welex Induction Log With LONG LATERAL Pinpoints Rt, Thin Zones Where Others Fail

A couple of points to remember about using an induction log to determine Rt:

1. Under certain invasion conditions and diameters, an induction curve does not read Rt directly.

2. An induction curve also often overlooks thin (4′ or less) resistive zones bounded by conductive zones.

Now addition of the Long Lateral curve to the Welex Induction-Electric Log solves both problems simply and accurately.

For the first time you now can get a truly COMPLETE Induction-Electric Log — one that pinpoints those thin, hard-to-see zones and overcomes the effect of deep invasion in determining true resistivity. This is another "first" by Welex.

The problems of deep invasion on short-spaced curves became apparent early in the evolution of well logging.

Even with today's advanced tools this same problem of invasion continued to exist — until the introduction of the Long Lateral curve to the Welex Induction-Electric Log.

This new development offers the industry a tool that can run simultaneously an S.P. curve, 18″ normal curve, deep investigation 40″ Induction curve and either a 16′ or 24′ Long Lateral curve.

This is the COMPLETE Induction-Electric Log, and when run with one of Welex's porosity logs, interpretation using Welex's simplified charts or "pigtails" is easy, quick and accurate.

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Views That Make News

Oil Must Fight Back

Dear Sir:

Please accept my congratulations on your forthright editorial "Too Much Time Wasted on Resid Imports" [PW—Mar.17'61,p56].

As you so clearly point out, the coal industry is waging its fight against oil and gas in a united and forceful manner. A substantial segment of our industry is giving them aid and comfort by supporting them on residual imports. The coal threat is a serious one. If oil doesn't unite and fight back, we might suffer real harm. Your timely words will help to close our ranks.

MORGAN J. DAVIS
President
Humble Oil & Refining Co.

A Clear 'Fracture' Story

Dear Sir:

Busy as I am, I found time to not only read but to reread the fine article " 'Cleavage Fracture' Causes Determined" [PW—Apr.7'61,p36].

I'd say this is about as fine a specimen of reporting on an abstruse subject as I have ever read.

The chap who did the job ought to be complimented. I think I know how to write this type of report myself; but what impresses me is the way ideas are put together.

Keep on, you're doing alright.

R. J. HUGHES
Shreveport, La.

Prediction For 1961

"If normal conditions prevailed, I would not hesitate to predict a very outstanding year in 1961. Our optimism, however, is tempered by the economic conditions of the day. In addition, the petroleum industry is still confronted with the problems of abundance which have brought about a further decline in consumer prices. These are now at the lowest point in ten years and in some areas taxes are equivalent to 50% of the retail price. It is our hope that prices have bottomed out and may possibly recover somewhat."

—W. HAROLD REA
President
Canadian Oil Co. Ltd.

Contractors' About-Face

"I believe there has been an about-face during this past year on the part of contractors and operators. Management began to question the true economy. Drilling prices were lower but well costs were skyrocketing. The quality of the work was not there. Operators immediately began to question the ability of the contractors to perform their function for the oil industry if the trend continued. In other words, they could be forced back to company rigs, if they were to obtain improvement in the future. Contractors also started thinking and working. Demands by creditors, personnel-replacement difficulties, and increased drilling hazards through new techniques forced an immediate reappraisal of themselves, their companies, their customers, their contracts, and their finances. It became obvious then that the contractor and the operator had a joint problem with a joint responsibility and that each needed the other. With that in mind, there has been more progressive action taken in the past 12 months, working together to improve the situation, than in the past ten years."

—ROBERT L. PARKER
President,
Parker Drilling Co.

Imports: A Bitter Pill

"Take mandatory import controls. What started rather naively to be an uncomplicated program is now a complex and full-scale regulatory system. It is causing extreme bitterness in the industry itself and, more significantly, is drawing the government further and further into the industry's affairs."

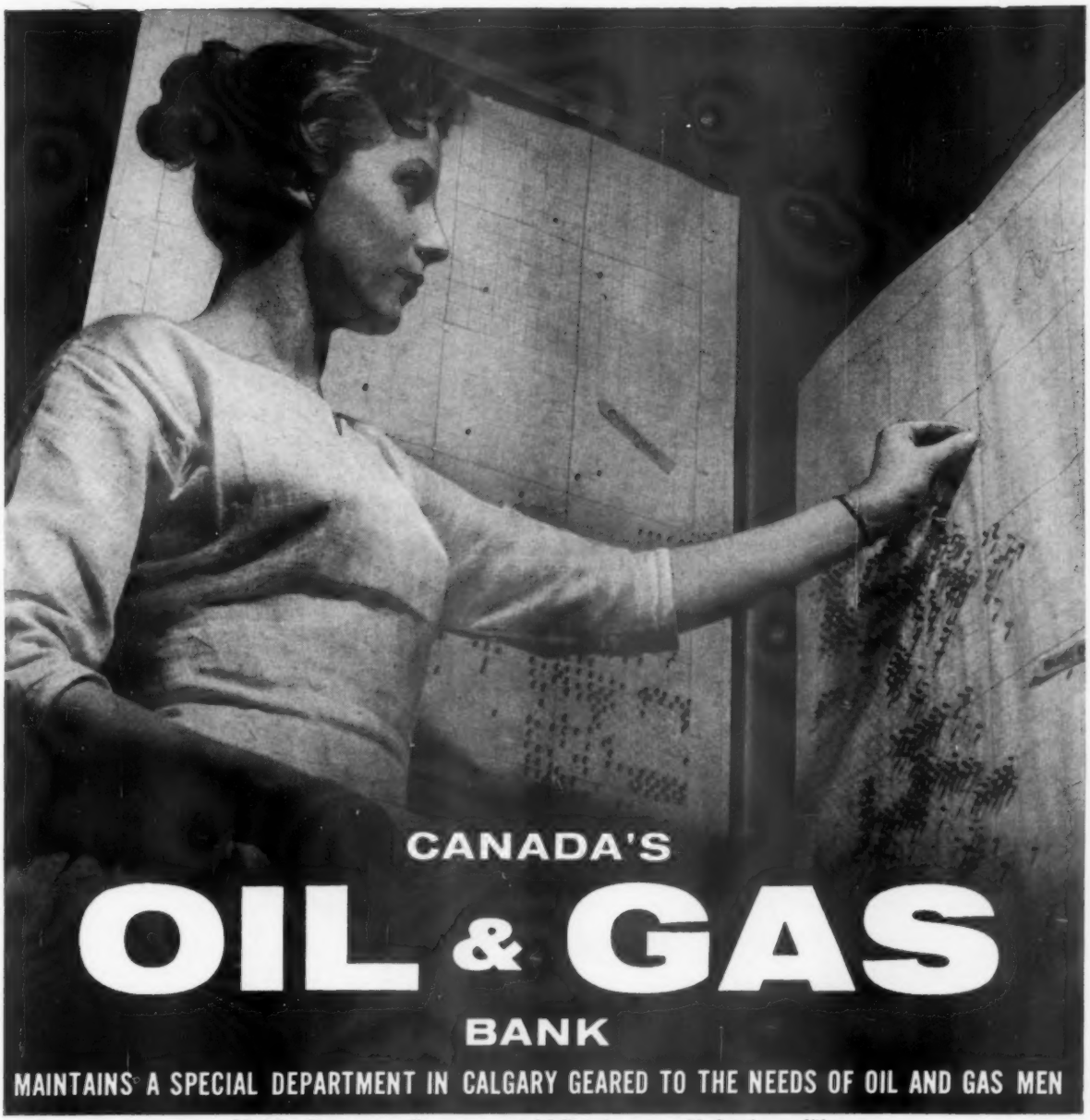
—CHARLES E. WEBBER
Director, natural gas administration
Sun Oil Co.

Abandon Acquiescence

"There is not a threat to our nation which could not be met if we, as a nation, decide to abandon our acquiescent society and demand a return to constitutional rights which were surrendered in times of temporary setbacks, when we acquiesced to the politicians' pleas to let them do what they said we couldn't do."

—COL. WILLARD F. ROCKWELL
Chairman
Rockwell Mfg. Co.

PETROLEUM WEEK *will publish reader comments each week. Address letters to LeRoy Menzing, Editor,* PETROLEUM WEEK, *330 W. 42nd St., New York 36, N. Y.*



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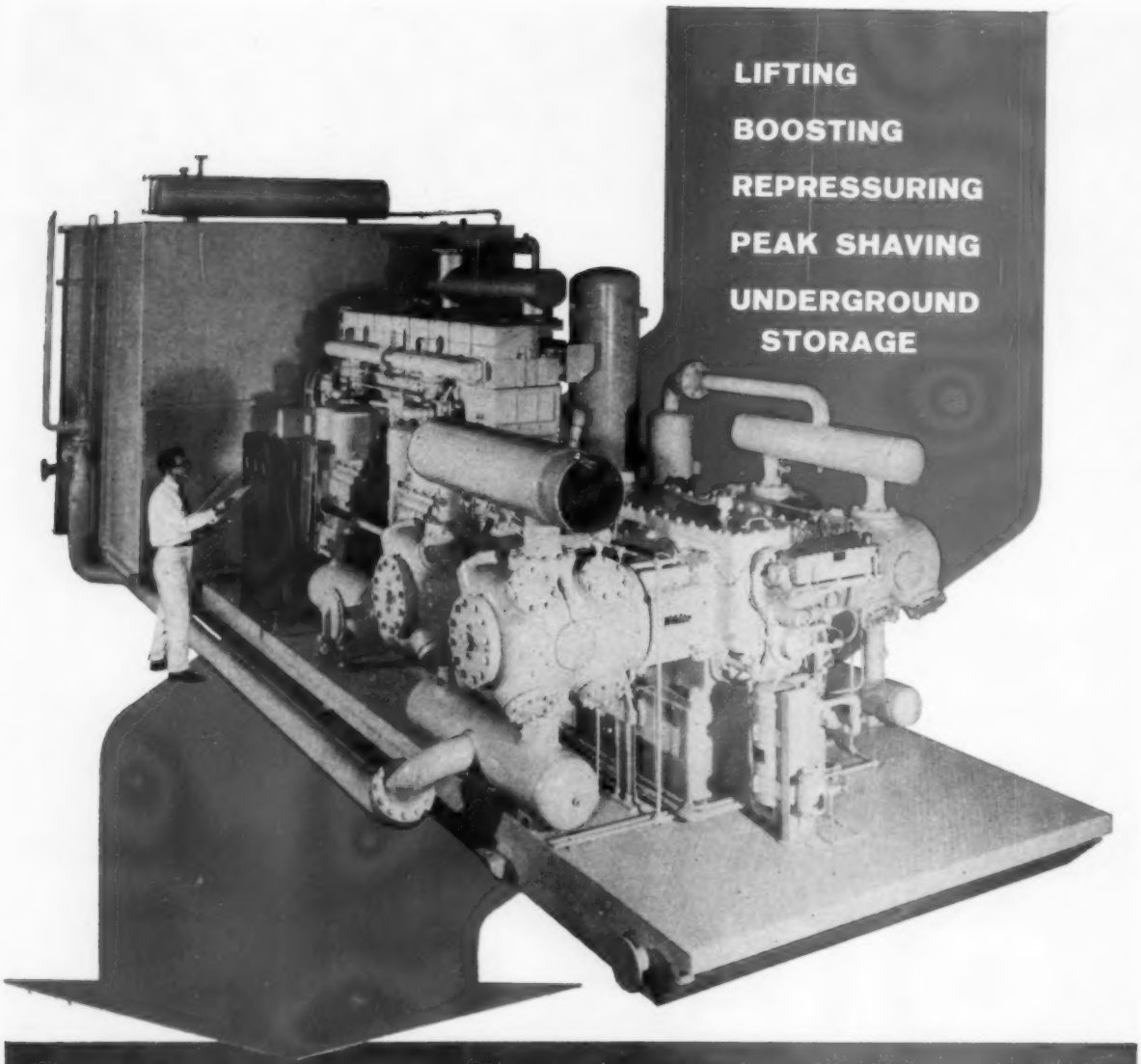

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Capital Spending Plans Insure Strong Economy in the Future

	1960	1961	1962	1963	1964
		(millions)			
All Business	$35,690	$35,350	$34,150	$33,060	$33,340
Utilities	4,789	5,070	4,945	5,120	5,220
Transportation & Communications	6,100	5,490	5,280	5,150	5,570
Petroleum	**will pump nearly $25-billion into exploration, plants, and equipment in the next four years.**				
Chemical	1,600	1,660	1,580	1,600	1,740
Auto Industry	890	1,010	1,000	1,160	1,030
Steel Industry	1,600	1,180	1,330	1,040	1,120

	1960	1961	1962	1963	1964
Total Petroleum	$6,003	$6,376	$6,174	$6,053	$6,144
Drilling & Production	3,596	3,452	3,521	3,556	3,592
Transportation	1,197	1,384	1,096	1,007	1,013
Processing	618	803	835	760	798
Marketing	498	598	616	622	628
All Other	94	139	106	108	113

The petroleum industry now plans to boost its capital and exploration expenditures this year by 6.2% to a record $6,376,000,000, and has budgeted at least $6-billion a year through 1964.

The spending plans for 1961 are based on reports of companies compiled by McGraw-Hill Publishing Co.'s economists.

The presently planned expenditures for this year are slightly lower than the indications the oil companies gave last fall, when their preliminary budgets showed outlays of $6,688,000,000 for drilling and new plants and equipment for 1961.

Over-all capital spending plans of business generally, totaling $35,350,000,000 for 1961, are down 1% from the outlays last year. But business generally appears more optimistic now than it did last fall.

At that time, the spending plans for 1961 were placed at $35,070,000,000, or 3% below 1960.

The pattern of capital spending for 1961 varies widely among industries, however. Automobile manufacturers appear to be the most optimistic, with expenditures set at slightly more than $1-billion, an increase of 13.5% over 1960.

The iron and steel industry, which has been operating at only half capacity, indicates it will cut its capital outlays this year by 26.3% to $1,180,000,000.

The spending plans for the years beyond 1961 are tentative, but President Kennedy last week proposed a shot in the arm for business that could encourage substantially higher outlays if Congress goes along.

The President's tax message asked Congress to lop $1.7-billion from the tax bills of business firms that can qualify for tax credits through spending for new plants and equipment or for modernization and replacement.

The credits proposed by the President would give cuts of up to 30% in taxes of corporations, proprietorships, and partnerships, under a formula geared to depreciation allowances.

Kennedy estimated that his proposal should stimulate between $2-billion and $3-billion a year in new investments and should create 500,000 new jobs.

Expenditures for modernization and automation are the objectives for industries, such as petroleum and steel, with ample surplus capacity.

Specifically, the Kennedy proposal would allow a minimum tax credit of 10% of the first $5,000 invested in new capital equipment. That credit could not be used, however, if additional credits exceed $500.

The other credits proposed would permit a company claim as tax credits 15% of all new capital investments above its current depreciation allowances, and 6% of all such investments amounting to between 50% and 100% of depreciation allowances.

The proposed credits have two limitations: No extra tax credit would be allowed for investments in plant and equipment with a life of less than six years, and no company would be allowed to take a credit in any one year amounting to more than 30% of its normal income taxes.

A company spending $2-million to modernize a refinery with depreciation allowances of $1-million would be entitled to tax credits of $180,000, if that figure didn't exceed 30% of normal income tax liability.

Kennedy's proposed incentive for capital spending will face considerable opposition in Congress, however.

Many lawmakers prefer changes in the tax law that would give individual taxpayers reductions that would aid business through higher consumer spending.

That's the position held by labor leaders, who claim that business needs no additional incentives and who are concerned over layoffs which they attribute primarily to automation.

Also, some congressmen who favor liberalized depreciation say the Kennedy proposal is pegged too much to credits for large firms with substantial depreciation charge-offs.

Regardless of what incentives to capital investments come out of Congress, the nearly $25-billion in outlays planned by the petroleum industry during the next four years reflects an optimistic outlook.

There are no indications that the rate of growth in demand for petroleum will take a sudden upturn from its recent trend of between 2% and 3% per year.

But the industry's spending plans are based primarily on modernization and improvements in efficiency,

rather than substantial additional capacity.

Expenditures for drilling and production this year—a sizable portion of which are noncapitalized outlays—will be the only category in the industry to decline.

The planned expenditures for exploration, drilling, and production for 1961 are placed at $3,452,000,000, a decline of 4% from the actual outlays in 1960.

Looking to future years, the now-planned capital and exploration expenditures to find and produce oil and gas will run higher than is budgeted for 1961. The average for the 1962-1964 period exceeds $3.5-billion.

Expenditures for exploration, drilling, and producing in 1961 will account for only 54.1% of the total petroleum capital outlays, the smallest percentage in recent years.

Last year's $3,596,000,000 spent for exploration, drilling, and producing amounted to almost 60% of the total capital and exploration expenditures.

And for most of the postwar years, these expenditures accounted for approximately 70% of the total capital expenditures of the industry.

The lower percentage now planned for 1961 reflects primarily the surplus producing capacity available to the industry, both in the U.S. and world-wide.

The decline in outlays for producing facilities will be offset by sharply higher expenditures in other branches of the industry. Transportation outlays, for example, will be up 15.6% this year to $1,384,000,000.

By far the greatest emphasis in transportation expenditures will be natural gas transmission and gathering. Slightly more than $1-billion is scheduled to be spent on gas arteries by the industry this year, an increase of 19% over 1960.

And present plans indicate that spending for natural gas lines will continue high, according to tabulations by the American Gas Assn. The 1962 plans show $795-million in preliminary budgets, and approximately $700-million has been ticketed for both 1963 and 1964.

Expenditures for refining and petrochemical facilities by the petroleum industry in 1961 are now set at $803-million, 29.9% above 1960.

The spending programs for petrochemicals will cover new and expanded facilities for finished products and processed intermediates.

The outlays for refineries, however, will be almost entirely for modernizing existing capacity, with particular emphasis on fuel-finishing units.

But even with the emphasis on modernization, the tentative capital budget for the three years beyond 1961 run close to $800-million per year.

Capital outlays in marketing will be up 20.1%, reflecting the continued competition for outlets.

Marketing expenditures, which have been growing in importance in the recent years, will account for $598-million this year. And more important, greater emphasis is being placed on marketing in the immediate future years, with budgets as presently drawn allocating more than $600-million per year in the 1962-64 period.

For the long-range future, capital spending most likely will be at a high rate, assuming even a modest return for the funds now going into research. The petroleum industry this year expects to spend $319-million for research, a 3% gain over 1960. And by 1964—based on present plans—the research outlays will be $338.1-million, up 9.2% over 1960.

4c Motor Fuel Tax Appears Set

The House Ways & Means Committee has settled on a compromise tax formula to pay for the interstate highway program which means continuing present motor fuel taxes.

The highway tax package, which is likely to have clear sailing in both House and Senate, calls for maintaining the federal gasoline and diesel fuel tax at 4¢ a gal., increasing taxes on heavy trucks and tires, and tapping the Treasury's general fund for approximately $150-million a year.

The fourth cent of the gasoline and diesel tax was due to die June 30.

The committee measure would provide the extra $9.7-billion sought by President Kennedy to keep the federal highway program on schedule, but it differs from the President's views on how the funds should be raised.

The President requested that the burden for paying for the 41,000-mi. superhighway system to be completed by 1972 fall on motorists and truckers.

Without additional funds now, completion of the system, 90% of which is to be paid for by the federal government, would drag on until 1977.

Kennedy's proposed financing plan would have put the sharpest tax bite on the large truck-trailer operators, with an increase in user taxes for trucks weighing over 26,000 lb. Those vehicles, now taxed at $1.50 per 1,000 lb., would have had to pay $5 per 1,000 lb. Taxes on tires, tubes, and tread rubber would have been boosted by the President's proposal

Kennedy also wanted to hike the tax on diesel fuel from the present 4¢ a gal. to 7¢ a gal. and retain the fourth cent of the gasoline tax.

The House committee agreed with Kennedy that motorists ought to continue their payment of 4¢ a gal. in gasoline taxes, but turned a sympathetic ear to truckers' protests against higher taxes.

The truckers challenged the Bureau of Public Roads study—the President's basic support for his tax plan—which showed that large trucks are not paying their fair share of highway costs.

The committee voted to reduce by 50% the amount of new highway revenue the Administration sought from the large truck operators.

It also overrode Kennedy's plea that general Treasury funds not be used to finance highway needs. Kennedy said such a practice would only increase the anticipated deficit in the federal budget for the next fiscal year, starting July 1.

Committee members argued that since the general public benefits from highways, at least a portion of the cost should come from the Treasury.

Administration sources say the House committee's decision will not be opposed.

The extended and increased taxes voted by the committee will raise an estimated $750-million annually, with nearly $650-million coming from the continued fourth cent of gasoline taxes. The latter would be extended until Sept. 30, 1972, under the committee's proposal.

The annual $750-million in taxes, plus the $150-million to be withdrawn from the general Treasury for the Highway Trust Fund, is expected to meet the present financial requirements for highway building program.

The revenue to be taken from the Treasury's general fund is a portion of the manufacturers' excise tax on new trucks, buses, and trailers. At present, half of that tax goes toward highway financing.

In addition to continuing the present gasoline and diesel fuel taxes, the committee's bill would raise the tax on trucks weighing 26,000 lb. and more to $3 per 1,000 lb.

Also, the committee voted to increase to 10¢ per lb. the present 8¢ tax on tires and the 9¢ tax on tubes.

When to—or Not to—Lease Equipment

Should an oil company buy or lease its equipment? That's a question that is puzzling more and more oil men these days.

A guide for the situations where it is better to lease and those where it's better to buy was outlined last week by I. J. Slay and W. L. Jenkins, of Waukesha Sales & Service, Inc., at the West Texas Oil Lifting Short Course, in Lubbock.

They hastily cautioned that there is no one best method of obtaining additional financing for all firms at all times under all circumstances.

Basically, they said, since leasing amounts to just another method of borrowing capital for comparatively long-term periods, an oil company has only to figure out what it costs for its cash to be frozen in equipment, and determine whether it would be cheaper to pay the leasing company to use its capital to acquire the equipment.

For companies that do not have spare cash to put into equipment, use of the leasing concern's cash proves a great boon.

"There are definite reasons why producing companies have turned to leasing," Slay and Jenkins said. "First, without turning liquid working funds into capital expenditures, it offers a method of increasing output profitably. Second, it is a simple means of broadening a company's borrowing base. Third, it is a means of expanding production and yet keeping pace with the ever-increasing cost of newer and more complex equipment.

"Leasing permits a company to use more fixed assets while retaining more liquid working capital.

There are seven major benefits of leasing, according to the Waukesha spokesman:

- Leasing is valuable to a firm whose growth is impeded by a shortage of capital.
- Leasing offers virtually 100% financing rather than 66⅔ to 75% financing.
- Leasing is valuable to a company anxious to modernize its equipment, methods, or procedures, but which does not wish to use up its short-term or long-term credit for the acquisition of equipment.
- Leasing is valuable to a growing company that needs more capital, but whose owners do not wish to dilute their equity by acquiring stockholders or partners.
- Under certain circumstances, leasing may offer tax advantages.
- While the gross dollar cost of leasing is greater than cash purchase, the net cost is less than any other method of acquiring equipment.
- Financing through leasing usually offers a longer term than any other short-term financing.

On the other hand, leasing has little to offer to a firm that has enough cash, and all the modern equipment it needs to compete.

Leasing also has no value to a firm, the two men said, that prides itself on owning all its equipment, buildings, and land. In addition, they pointed out, the gross dollar outlay for leased equipment is greater than that for equipment purchased for cash.

It is probably better for a company not to think about possible tax savings when it decides whether or not to lease.

Leasing is not a method of tax avoidance, the men cautioned—though some less dependable leasing companies do use tax saving as a selling point.

"When one leases, he pays for equipment entirely out of income-before-tax dollars. In true leasing, there is no intention of purchase; therefore it avoids the danger and pitfalls found in conditional sales contracts from a tax standpoint."

Equipment obsolescence is another factor to consider.

Ownership of an asset may not necessarily be an advantage, the Waukesha representatives argued. A company can replace equipment when business conditions demand it, and "each firm should make an accurate appraisal of capital expenditures," they said.

Maintenance also enters the leasing picture. Gas engines, for example, can be leased for a fixed monthly fee, including complete maintenance.

"In many cases," Slay and Jenkins said, "this is the most economical method of lifting crude."

The approach to leasing the gas engine outright as a prime mover to drive a given piece of equipment differs from other equipment-leasing primarily in the length of the lease. Gas engines can be leased for a minimum period of one year, whereas the usual base rate for leasing special equipment in package units varies from three to five years.

Leasing with maintenance frees personnel for other duties, or it can cut costs by a reduction in personnel.

In addition, there is no need for the company to over-design the engine at the beginning of the project. Under leasing, the engine can be sized for the exact requirements, and, after a reasonable length of time, replaced by a larger unit.

Leasing gas engines also provides these advantages: no need to stock spare replacement parts; everything billed in one invoice to cut paper work and bookkeeping to a minimum; and a predictable cost of operation for the life of the project.

A just-released study backs the contention that the rental concept is an ideal solution for companies short on ready cash.

The study, made by Inelco, Inc., Houston, hits hard on one basic premise—it isn't economically wise to freeze capital in outright purchases when this money can be used to produce profits.

The newly established company points out that a purchaser doesn't actually buy a capital asset—he actually buys "the productive use of the asset over its expected life."

And, it says, the long-term leasing of plants, facilities, and equipment is just now coming to the fore as a widespread, across-the-board development in petroleum.

NEXT WEEK *Be Sure to Read:*

PROCESSORS REPORT on processing . . .

Processors are optimistic about the future, a world-wide survey by Petroleum Week finds. They believe substantial new markets will be found for petroleum-derived products and that current research is leading to significant changes in technology that will improve processing economics.

Surplus Swells to 18-Million Bbl.

Oil's over-all inventory position has deteriorated despite the hefty cutbacks in refinery throughput reported by major crude buyers last month.

All told, crude purchasers reporting to the Texas Railroad Commission reduced refinery runs 11.4% in March, or 785,511 b/d from February. But their stocks of major products as of Apr. 1 were close to 16-million bbl.—too much for this time of the year.

Industrywide, refinery runs averaged 8,045,000 b/d for March, a decrease of 368,000 b/d from the previous month, but still 1.6% higher than the year-ago level.

Stocks of the larger crude purchasers were swelled by 6.5-million bbl. during March—and products were already at the danger point.

March is pretty much a limbo for the oil industry—too soon for the motoring season to be in full swing, and too late for strong distillate demand. As a result, stocks of all major products were in long supply—except residual, which was reported to be some 72,000 bbl. short of the industry benchmark.

Because of the warmer-than-normal March, stocks of distillates have become an even sharper thorn in the industry's side—they are now 13.5-million bbl. higher than "desired" levels.

At the end of February, the larger crude buyers had reported that their stocks of distillate were 8-million bbl. too high.

The gasoline position has improved slightly, as might be expected: On Mar. 1, the surplus in gasoline stocks was reported as 4.8-million. As of Apr. 1 the surplus dipped to 2-million bbl.

There's more trouble ahead. Second-quarter demand may be as much as 1.6-million b/d under the first quarter.

If forecasts prove correct, supply will have a 351,000 b/d edge over demand during April, May, and June. And this will show up in product inventories.

The Bureau of Mines in its latest forecast shows that May demand for crude can be expected to average 6,920,000 b/d, compared with 6,928,000 b/d in May of 1960.

With crude in oversupply, too—by close to 2-million bbl.—the Texas Railroad Commission cut back the state's May allowable to eight days, from a nine-day schedule in April.

Next month's schedule will allow production of 2,636,562 b/d—dropping the quota 233,794 b/d from mid-April.

Of the major crude buyers, eight favored an eight-day producing schedule, three voted for nine days, and one for a seven-day schedule.

There's bitter opposition to the commission's order from many independents because "other states feast while Texas famines."

Welsey West, Houston independent, says the commission should allow 30 days' production from Texas wells —or more. Texas is dying a slow death, he asserted, while production is booming in other states.

In advancing the 30-day production idea, West said: "The whole thing is based on the chance we're trying to uphold the price of oil . . . "If we break the price, [let's] make it so low it wouldn't pay the cost of transportation on imports."

But other independents think differently. George Anderson, Wichita Falls, of the North Texas Oil & Gas Assn., said that experience proves overproduction hurts, and that the 30-day plan would be unfair both to producer and consumer.

Another advocate of the eight-day order was E. L. Wilson, representing a group of Dallas independents. He commented that U.S. market demand in the first-quarter of 1961 was 2% below a year ago.

Meanwhile, as Texas producers tighten their belts, 4,000 b/d of Alberta light crude will be moving into a new U.S. market in May.

The purchaser, British American Oil Co., Ltd., will supply the Alberta crude to Ashland Oil & Refining Co.

A B-A spokesman says the crude will move down the Interprovincial pipeline to Bay City, Mich., and on by tanker to Ashland's refinery in Tonawanda, N. Y.

Alberta crude nominations for May total 452,813 b/d, compared with 412,543 b/d in April.

Condensate and natural gasoline nominations totaled 17,560 b/d, or 2,375 b/d lower than April.

Of the total movement of crude to refineries in May, exports to the U.S. will account for 130,800 b/d, compared with 123,115 b/d this month.

The Louisiana allowable will be up next month.

The May and June allowables were set at 1,034,222 b/d. This is 18,691 b/d higher than the March-April flow.

Conservation Commissioner James Gill said the increase was to take care of new production.

March refinery runs reported to the Railroad Commission averaged 6,123,967 b/d, down 785,511 b/d from February:

(barrels daily)

	January	February	March
American Petrofina	22,949	n.r.	21,991
Atlantic Refining	200,625	209,549	187,596
Bell Oil & Gas	6,590	n.r.	6,537
Cities Service	263,462	262,153	247,618
Continental Oil	181,527	196,306	183,690
Cosden Petroleum	36,665	36,486	36,083
Crown Central	35,685	34,998	34,552
El Paso Natural	n.r.	18,357	19,974
Gulf Oil	471,000	467,540	462,610
Humble Oil & Refining	845,600	875,000	786,000
Indiana Oil Purchasing	693,000	698,827	601,000
LaGloria Oil & Gas	16,957	n.r.	16,538
Ohio Oil	100,699	n.r.	98,924
Phillips Petroleum	216,900	221,800	223,700
Plymouth Oil	29,979	35,069	35,377
Premier Oil Refining	12,015	13,496	16,866
Pure Oil	166,319	165,510	174,953
Shamrock Oil & Gas	23,481	19,456	23,355
Shell Oil	524,040	533,433	484,928
Signal Oil & Gas	47,530	65,696	52,613
Sinclair Crude Oil	433,469	430,691	406,598
Skelly Oil	53,254	n.r.	51,308
Socony Mobil Oil	611,000	594,000	585,000
Sohio Petroleum	124,548	144,285	141,562
Standard of Texas	50,532	51,353	52,253
Sun Oil	204,292	201,921	220,521
Suntide Refining	44,470	44,233	40,791
Texaco	652,204	678,986	646,478
Tidewater Oil	251,450	251,000	247,935
Other	36,515	659,373	16,616
Total	**6,356,757**	**6,909,518**	**6,123,967**

n.r.—not reported

Declining Enrollments in Earth Sciences Worry Industry Experts

The pickings are a bit leaner, but job prospects in the petroleum industry for the spring crop of college graduates seemingly are a bit better than it would appear at first glance.

There are a few high points here and there, but most companies are recruiting on about the same level as last year—which wasn't the best by any means, but still not too bad.

There's more selectivity this year than in former years, and the graduates who combine top marks with outgoing personalities are having little or no difficulty in landing jobs.

To find out what the job situation looked like—particularly in this period of personnel retrenchment among most companies—PETROLEUM WEEK editors talked to a variety of company executives and personnel directors in companies from coast-to-coast.

The biggest point of concern among oil company recruiting officials is the decline in enrollment in petroleum engineering, and in the earth sciences fields.

All agreed that this could be an omen of troubles and shortages of technical graduates a few years hence.

Right now, there's no problem; in fact, there's a surplus of geologists, petroleum engineers, and other earth science graduates and seasoned hands.

But by 1963 or 1964 this picture might change materially, they feel.

By way of example, the University of Texas reported recently that degrees in petroleum engineering dropped from 800 in 1957 to 400 in 1960, on a national basis.

Dr. Carl Gatlin, chairman of the university's engineering department, noted that in his own school current enrollments for petroleum engineering totaled only 14 freshmen and 12 sophomores—compared with 27 juniors and 61 seniors.

Gage Lund, vice-president of Standard Oil Co. of California and vice-president for production for the American Petroleum Institute, also expressed concern about the situation, in a recent address in Oklahoma.

"Undergraduate enrollment in the earth sciences has fallen to such a low level that a shortage in the number of geologists, geological and petroleum engineers, and geophyscists coming out of the schools is almost certain in the next year or two," he said.

"Latest statistics show that total enrollment in geology and geophysics in the U.S. was down nearly 13% last year, and freshmen enrollment declined nearly 37%."

Oversupply, cutbacks in operations, and personnel retrenchments are a few of the reasons that are cited as to why the petroleum industry has lost its aura of glamor for undergraduates.

During the postwar years, when things were booming in the oil industry, oil company recruitment experts combed the colleges and universities for technical graduates bombarding them with offers.

But now the fuzz is off the peach, and other, more glamorous industries have more appeal for the undergraduates—and, in many cases, are offering better salaries and job futures.

"The decline of student interest in the drilling and producing phases of the oil industry," Dr. Gatlin commented brusquely, "is a direct consequence of pessimistic opinions as to the 'dire' straits of the oil industry."

Lund's comments were parallel:

"To those of us who have been in this business all of our lives it may come as a rude shock, but the oil business, it seems, no longer ranks very high in the lineup of glamorous, adventurous places to earn a living."

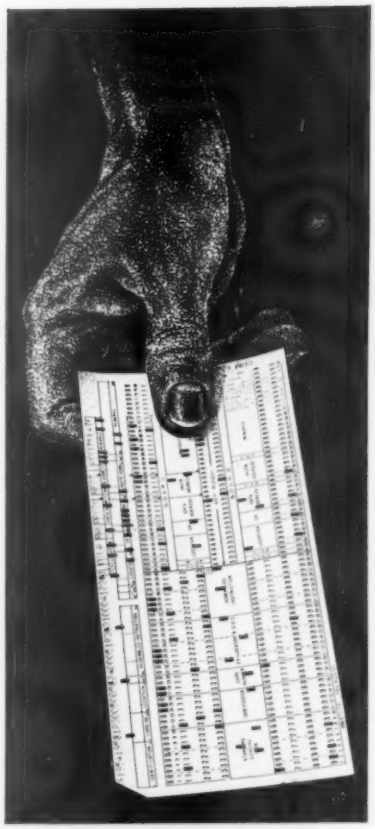
One personnel expert suggested that the oil industry will have to redeem itself with a steady program of recruitment and hiring to assure an adequate supply of trained graduates in the future.

"We can't afford to have these peaks and valleys in hiring any more," he said. "Only steady programs will convince undergraduates and the guidance and placement officials of colleges and universities that there's a substantial future in the oil industry, so that they'll aim themselves in our direction.

"This might mean leveling off in some years, and jacking up in others, but this will add up to consistency in the long run—and that's what we need if we're going to replenish our manpower in the years to come."

Most of the oil companies have finished their recruiting for this spring, and have had no difficulty in matching supply and requirements.

The majority recruited on a conservative level. Three companies reported considerable acceleration in their recruitment programs, and one anticipates a big step-up next fall.



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DWIGHT PRATER (seated) was born in Sylacauga, Alabama, in 1917. He holds a Ph.D. in biophysics from the University of Pennsylvania and has been a Mobil employee since 1951. An accomplished oboist, Dr. Prater manages the Haddonfield (N.J.) Symphony Orchestra.

JIM WEI was born in Macao, 30 years ago. He joined Mobil after receiving his doctorate in chemical engineering from M.I.T. in 1955. Dr. Wei is also a classical music enthusiast and plays piano for relaxation.

WHAT DOES A CHEMICAL REACTION LOOK LIKE?

A MATHEMATICAL MODEL of one is shown in this picture. The model represents a reaction that takes place in oil refineries every day.

Using an "off-beat" branch of mathematics, illustrated by this three-dimensional model, these Socony Mobil scientists have recently made an important breakthrough in the field of theoretical physics. They found a way to describe exactly what happens to petroleum molecules during refining. It formerly took hundreds of expensive laboratory experiments to get this information.

Their discovery allows Mobil to control chemical reactions with precision. As a result, we can now "freeze" refinery processes at exactly the proper stage to obtain maximum amounts of the products we want most. This means better products for Mobil customers.

These scientists have probed deeply and successfully into the foundations of petroleum reactions. The full implications of their breakthrough extend far beyond the specific problems of petroleum refining. Their work has given scientists everywhere greater insight and understanding into a fundamental process of nature.

Mobil encourages its scientists to give full play to their research interests and abilities. Dwight Prater points out that "our discovery was in a field in which neither one of us specialized at college."

Mobil scientists also are free to explore ideas which may appear to have little immediate application to the company's operations. Jim Wei notes, however, that "many of these investigations pay off handsomely later on—for the company and for us."

Dr. Prater and Dr. Wei are two of the 1,500 men and women engaged in Mobil's $25,000,000-a-year research program—in which imagination is turned into ideas, and ideas into better products and processes.

Probing the far frontiers of science pays off not only for Mobil, but for everyone who does business with Mobil—customers, employees, licensees, and investors.

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Formjel Stops Mud Loss Into Production Zone Where Oyster Shells Failed in Carter County, Okla.

PROBLEM: To stop mud loss into Flat Top Formation during cleaning out and milling operation. 1,600 lbs. of oyster shells—a solid blocking agent that is usually effective—failed to stop lost circulation, which reached 50 bbls./hr.

SOLUTION: Formjel was applied through the drill pipe in two 1,000-gallon stages. It effected a reduction in mud loss to less than 1 bbl. per hour for the remainder of the cleaning-out period—one week.

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What's New IN THE INDUSTRY

Continental Oil Co. has followed Gulf Oil Corp.'s lead and boosted its posted price for New Mexico sour crude by 6¢ a bbl. The new price for 40-gravity oil is $3.01 a bbl. The company said the move would make this type of crude competitive with sweet crudes of similar gravity in West Texas and New Mexico. The Conoco adjustment also includes a change in differential from 3¢ to 2¢ for each degree below 40-gravity.

•

Standard Oil Co. (N.J.) is being sued for $41-million by two Italian refining companies that charge refining processes developed for them by Jersey fail to meet production specifications.

The actions were filed last week in federal court in Newark, N.J., by Azienda Nazionale Idrogenazione Combustibili (Anic) and Stanic Industria Petrolifera. Jersey Standard and Anic each hold half interests in Stanic.

The complaint charges that a hydroformer at the companies' Leghorn (Italy) refinery and a powerformer at the Bari refinery were not functioning up to specifications. The facilities were designed by Jersey's research affiliate, Esso Research & Engineering Co.

Jersey said last week it had not yet seen the complaint. It added it expected the hydroformer would ultimately reach design specifications, and that a proposal to resolve difficulties in the other unit had been submitted, but not acted upon by the complainants. The company "is disappointed to find suit brought without further discussion."

•

South Penn Oil Co. and Zapata Petroleum Corp. have teamed up to develop natural gas production in Canada and to buy producing properties in the Southwest and Mid-Continent areas of the U.S.

The new venture, which will be particularly interested in acquisition of waterflood and other secondary recovery prospects, marks the expansion of South Penn into the Permian Basin and Mid-continent areas. Zapata will serve as operator.

Under terms of the agreement, South Penn—a pioneer in development of secondary recovery techniques—will acquire a half interest in Zapata's Canadian company, which owns some 185,000 acres of partially developed gas leases in Western Canada.

Tennessee Gas Transmission Corp. is planning an 8.3-mi., 20-in. gathering line in the Gulf of Mexico, off Louisiana. Cost: $1,597,000.

The company has already applied to the Federal Power Commission for permission to build the line, which would handle 50-million cf/d and run from Block 68 to Block 71, West Cameron area. It would take gas produced by Superior Oil in exchange for gas produced by TGT in Vermilion Parish, La.

•

Freight-rate reductions have been put into effect for natural gas products shipments originating in the Southwest, bound for the Midwest.

Behind the cut: greater economies from large-capacity tank cars.

The first large-capacity car to ship under the new rate—already approved by the Interstate Commerce Commission—was a "jumbo" 30,000-gal. unit, from Lerch, Ark., to the St. Louis area, via Kansas City Southern R.R. The revised freight-rate formula for the 30,000-gal. car for this particular movement accounted for a 1.3¢-per-gal. cut in the previous rate of 2.8¢ per gal.—a cut of approximately 45%.

•

The declining number of jobs available is worrying members of the Oil, Chemical & Atomic Workers Union. The first two regional meetings of OCAW's oil policy committee groups, in Kansas City and Salt Lake City, discussed the problem and said: "Automation is given as the major cause of declining work forces. Also blamed, however, are other items, including contracting-out of work and a general tendency on the part of the companies to speed up and stretch out work."

Another point worrying OCAW members, the union said, is fringe benefits, particularly hospitalization and medical insurance. Dissatisfaction was expressed by many delegates over rising costs of this insurance and over company methods of administering the insurance.

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Robert Walker has been named executive vice-president and general manager of Reed Roller Bit Co. He was formerly manager of the Cleco Air Tool Division of Reed.

Looking Ahead in Washington

PETROLEUM WEEK

April 28, 1961

President Kennedy has set the time and place for what may be oil's crucial fight for percentage depletion: Congress in 1962. Kennedy's tax message to Congress for 1961 did not mention depletion. But it calls for a thorough overhaul of taxation, and promises that Congress will get the Administration's proposals next year. Fewer tax incentives down the line, together with generally lower tax rates, will be proposed. With an Administration replete with antidepletionists, oil will have its work cut out.

Some Washington oil spokesmen foresee the greatest threat the 27.5% for oil and gas has ever faced. They predict easy defeat for any one-shot attempt to cut the rate by a depletion foe such as Sen. John J. Williams (R., Del.). But they say the possibility of a cut as part of a broad tax-reform program is so real that the industry should consider offering a compromise, to maintain its voice in negotiations.

Others insist that broad-scale reform will never get off the ground, and that oil should sit tight. The validity of this will be tested as Congress goes to work next week on Kennedy's carrot-and-stick approach to taxes for this year: an investment incentive for business, with "reforms" in other areas to make up lost revenue. If Administration tax policy-makers achieve substantial headway with this limited program now, they will be spurred toward more sweeping changes next year.

•

Kennedy's move to end tax advantages of U.S. subsidiaries in industrialized nations overseas will be fought by some industries, but oil's reaction is mixed. One major oil company tax expert says the impact on profits from foreign production would be slight. He notes that his company reports such profits annually in the U.S. to get credit for depletion.

Companies that market extensively in developed nations abroad take the opposite view. An official of one such company says elimination of tax deferral would be a serious blow. "We use income from the industrial nations to invest in less-developed ones," he says, "and if we have to pay the U.S. tax first, we just won't have as much to invest."

•

Opponents of tolls on inland waterways are wondering if Kennedy's campaign pledge against this form of user charge will stick. They note that the Administration is working out a unified policy toward surface transportation, and that Kennedy embraced the user charge philosophy in proposing a 2¢-a-gal. tax on jet fuel. Barge operators claim that a user charge will first cost them their petroleum traffic, and then undermine their entire industry.

•

API is still considering retaining a Washington representative authorized to speak for the industry on topics of general concern. API President Frank Porter has been spending more time in Washington, but the need is still felt for a permanent spokesman.

engine power
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CATERPILLAR ANNOUNCES TWO NEW POWERFUL DIESEL ENGINES FOR OILFIELD USE

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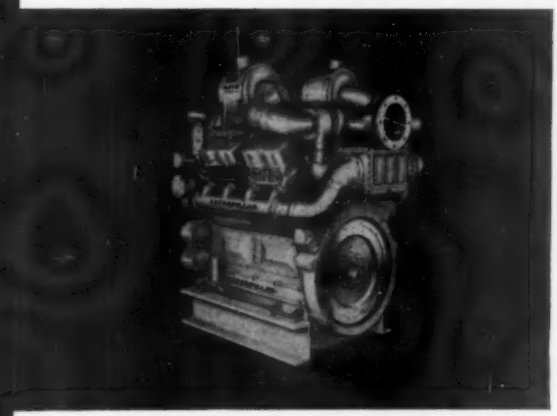
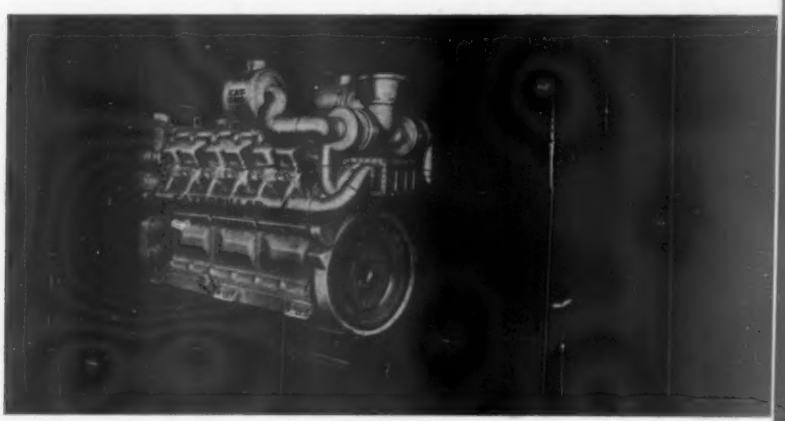
Both engines have twin turbochargers with divided aftercoolers—one for each cylinder bank—as standard equipment. There's a lot that's new and important about these engines. Your Caterpillar Dealer will be happy to tell you all about them. Be sure to specify Cat Engines to your supplier when you buy any petroleum equipment. Write for additional information.



THE 630 HP D379
This new Caterpillar Diesel V8 develops 630 HP @ 1300 RPM. As an electric set the rating is 350 KW continuous. The D379 requires only 30 sq. ft. of floor space.



THE 950 HP D398
950 HP @ 1300 RPM industrial engine rating and an electric set rating of 500 KW continuous make this Cat V12 Diesel one of the highest producers available for size and weight.

CATERPILLAR

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Engine Division, Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

'Dual Weight' Drill Pipe Passes Tests

"Dual Weight" internally tapered drill pipe has passed initial field tests.

The pipe, made by Pittsburgh Steel Co., has been used in the drilling of more than 82,000 ft. of hole in recent months over widely separated areas. Well depths have ranged to 15,000 ft.

Though there have been no unfavorable reports of its performance, according to the company, tests are continuing, with three additional strings being put into service to obtain further data.

The Dual Weight drill pipe has been used in drilling all or part of 29 holes so far in West Texas, South Louisiana, the Texas-Oklahoma region, and on the West Coast.

In the tests to date, the strings have been run according to all standard handling and operating practices. No restrictions were placed on drilling operations, and no special setups, equipment, or equipment revisions were required or necessary in any phase of the testing.

Essentially, Dual Weight is a seamless steel tube with two distinct wall thicknesses.

Each length consists of an integral combination of a light-wall body and a heavier-wall box end. The heavy wall extends at least 4 ft., but not more than 6 ft., from the box end.

The heavy well end provides extra strength for the section of the pipe most vulnerable to crushing, bottlenecking, notching, and bending—the area that is subject to stresses applied by the slips, tongs, and elevators.

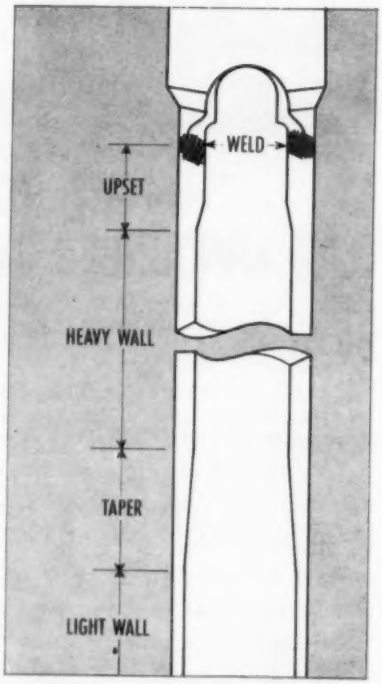
The transition section between the heavy and light wall areas consist of a gradual, uniform internal taper of wall thickness.

Externally, Dual Weight's dimensions conform to American Petroleum Institute standards. Both ends are upset for application of API weld-on tool joints.

Dual Weight is produced both in a light-weight version and in a regular-weight pipe with an extra-heavy box end to give added strength in very deep drilling (PW—Sep.23'60, p61).

In size range, Dual Weight is produced in Range 2 lengths from 3½-in. to 4½-in. outside diameter, with either an internal or external upset, and in 5-in. OD., with an internal or internal-external upset.

It is made in Grades E and P-95.



INTERNALLY TAPERED drill pipe is designed for strength and light weight.

The first string of Dual Weight pipe produced has been used in the drilling of 47,000 ft. of hole to date.

This string consists of six lengths of 4½-in., .337/.250-in. wall.

The initial tests of this string were aimed primarily at determining the durability of the wall transition area, as well as the durability and serviceability of the heavy-wall box end.

In the tests, the box ends, while considerably marked by slips, showed no effects of crushing, or reduction in diameter.

Pittsburgh Steel says that no pipe failure or damage has been reported, though Dual Weight lengths have been placed at points of the drill string for testing.

A second string of 6,000 ft. of Dual Weight pipe was used on a light rig.

This string of 4-in., .330/.254-in. wall was tested to determine effects of the pipe's lower weight. After some 25,000 ft. of hole were drilled with it, the contract driller reported:

- An estimated 15% uprating of the rig's depth limit.
- Reduced wear and tear on the rig and its components.
- Lower fuel consumption by power units.
- Faster roundtrips as a result of increased rpm. available through a lighter hook load.

Strength of the drill pipe's lightweight body was shown on one occasion when the drill collars became stuck in a key seat at the time the string was being pulled out of the hole.

The string was put under a tension load of 165,000 lb., and the collars were freed by jarring. There was no evident damage to the pipe, the company reports.

A third string of 15,000 ft. was assigned to a heavy rig rated to 20,000 ft.

This test was designed to determine hydraulic characteristics of Dual Weight.

The string of 4½-in., .337/.271-in. wall has been used to complete drilling at two holes of nearly 15,000 ft. each.

Actual footage with Dual Weight totaled 8,200 ft.

Evaluation of hydraulic data is still not complete, Pittsburgh Steel reports. Rig personnel, however, estimate that the pipe's larger, smoother interior provided a 25% increase in bit hydraulic horsepower; allowed pumping of larger volumes of heavy (15 lb.) mud at higher velocities; permitted reduction of pump pressures from levels normally required at depth, and thus contributed to lower pump maintenance; and provided improved penetration rate as a result of better bottomhole cleaning and better annulus returns.

A fourth string tested consisted of 12,000 ft. of Dual Weight with a regular body wall thickness and an extra-heavy box end.

Purpose of the field test, on another heavy rig, is to determine advantages of extra strength on the box end during deep well drilling.

To date, says the company, this string—4½ in., .406/.337-in. wall—has been used in drilling 5,084 ft. of hole on two deep tests.

The string was subjected to additional operating experience in fishing operations for broken drill collars and for one broken string of conventional drill pipe.

In addition to these field tests, one string of Dual Weight was given various surface tests by an independ-

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PRODUCTION PACKER
PRODUCT 415-D

THE DOUBTS that harass well operators got a real body blow when the now-celebrated Baker Retainer Production Packer was developed some years ago.

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WHAT'S THE SECRET of building a packer so tough and reliable you know it will keep you honest when you recommend it?

For one thing, it takes time—years of performance studies. We've sweated out failures and assessed our successes—sifted out weak points and strengthened the strong points.

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THAT'S A TOUGH proving ground—one that has helped us soak up a vast knowledge of what happens to slips, packing elements, and the like, when a packer is downhole. We've got the facts.

Baker made the first retainer packer—for many years the *only* retainer-type packer. The result is a wealth of packer experience that's hard to equal.

This remarkable packer shows it. Over the years we've refined it into a tool that has unyielding stamina. That's why we can call it the most predictable packer of them all.

This great packer has many applications—it's as versatile as it is dependable. It's a single-string production packer that comes in many sizes and bores. Moreover, it is surrounded by a family of accessories that transform it into a dual or triple packer—or into a temporary or permanent bridge plug or squeeze tool. Its formidable pressure-holding capacity makes it in many ways one of the finest of all squeeze packers.

It is set on a wire line—or on tubing or drill pipe. Baker's fast new milling tool mills one out in two to four hours—a fourth the time it once took.

For the latest practical knowledge of how to use Baker Retainer Production Packers, call your Baker Representative.

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BAKER

ent supplier in Louisiana. This inspection consisted of tension-testing of each length of the pipe to its minimum yield, in addition to an electronic inspection of each length's internal structure.

Pittsburgh Steel reports that these tests showed every length exceeded the allowable minimum yield and the entire string was found sound under the electronic inspection.

Engineering studies point to operating advantages.

The company says these studies of weight and dimensional characteristics indicate that drilling contractors would be able to uprate depth limits of rigs from 17% to 29%, and uprate the depth limits of drill strings from 14% to 30%, with the same safety factor at the slips, as a result of a 12% to 20% boost in box-end strength.

The full advantages and values of hydraulic characteristics have yet to be assessed by further use tests.

Geophysicists to Aid Nuclear Tests

Oil industry geophysicists will participate in the Vela-Uniform project to test methods of detecting underground nuclear explosions.

The Advanced Research Projects Agency of the Dept. of Defense is planning the Vela-Uniform test series as one of three parts of Project Vela. Other parts are concerned with ground-based and satellite-based detection of nuclear tests in space.

Dr. Charles C. Bates, chief of the Vela-Uniform branch of the ARPA, told the recent meeting of the Society of Exploration Geophysicists in Oklahoma City that the project would call for 11 to 23 chemical explosions and, if approved by President Kennedy, approximately 11 nuclear explosions.

No date has been set for the tests, but it is assumed some of them will be at the Atomic Energy Commission's Nevada test site. Among recommended shots is one in granite and another in a highly seismic area to compare earthquake and explosion signals.

Initial steps to expedite the cooperative efforts of petroleum geophysicists have been taken.

SEG has established a Committee for Cooperation with Governmental Agencies, with Lynn D. Ervin as chairman, to provide a smooth interflow of ideas.

ARPA last month selected Geotechnical Corp., Garland, Tex., to coordinate efforts of volunteers during the planned Vela-Uniform explosion series. Under the technical direction of the Air Force Technical Applications Center, Geotech will be responsible for informing volunteer participants of shot status.

Geotech has assigned a geophysicist, Joseph Whelan, to coordinate efforts of volunteer teams. He will work closely with the SEG committee to plan volunteer programs and will invite oil men and other interested persons to participate.

Geophysical crews in the field will be asked to help by recording observations at the time of the test blasts.

All groups participating will receive data on shot schedules and travel time of the signal from the tests. The travel time is necessary because of the short recording time of exploration seismograph recorders.

Present plans call for radio broadcasts from the Nevada test site to furnish field crews with data about each event in the Vela-Uniform program.

Each participating group will be asked to submit information about its own instruments and, when possible, accurate locations of each field site.

All information from field crews will be sent to a central point for preliminary analysis.

Geotech will be the central collection agency for all measurement data, with each team's seismographs going to the company's office in Garland for initial analysis. The Vela-Uniform research and evaluation center will do the final compilation and analysis.

The Air Force Technical Applications Center plans to operate 50 seismic observation posts at distances up to 2,500 mi. from the test site.

They will obtain data useful in resolving quantitatively the limiting effects on detection and identification techniques of such variables as depth, medium, type and size of energy source, propagation path, and degree of coupling of seismic signals, both natural and man-made.

Modern Methods Aid Texas Field

The value of modern recovery techniques in salvaging pay zones bypassed in the hurry to develop prime reserves is being underscored in the Long Lake field of East Texas.

The 28-year-old field centered in southwest Anderson County, 10-mi. southwest of Palestine, was opened by Tidewater Oil Co. and Texaco Inc.

Long Lake has yielded more than 27-million bbl. of crude and an unrecorded amount of condensate. It also has been a significant gas reservoir and at one time was a prime supplier of Dallas. Annual gas production there still is more than 5-billion cu. ft.

Formation fracturing appears a likely key to unlock the productive possibilities of the sub-Clarksville sands in the old field.

Long Lake has had oil and gas production from the Woodbine since its discovery in 1933, but the number of productive wells has dropped from 300 at the peak to approximately 100 now. Oil production in the Woodbine is at 5,300 ft. and the gas comes from 100 ft. higher.

Tidewater last year announced plans for a series of plug-backs in depleted Woodbine producers to test possibilities of higher formations.

Hopes were high for production from the sub-Clarksville because it was known pretty much to blanket the field, which had a Woodbine productive area of some 13,000 acres, extending into both southwest Freestone County and northeast Leon County.

Initial production from the sub-Clarskville was disappointing, but use of formation fracturing has changed the outlook.

Tidewater's first tests were somewhat less than satisfactory, as completion was on the order of 10 b/d on pump from the 4,900-ft. pay level.

After fracturing, though, Tidewater got 100 b/d of 46.4-gravity from No. 1 Dave Reagan, John Adams survey, near the field's center. The oil flowed through 11/64-in. choke and perforations at 4,961-81 ft. Gas-oil ratio was 904 to 1.

The success of fracturing operations has led to a speedup in a well completion program. It is believed doubtful, though, that the sub-Clarksville production will match that which has come from the Woodbine.

Bitumastic® No. 50 protects tank for corrosive, swamp-land service

The problem of protection for metal tanks in soils with high moisture content has long been a matter of concern to corrosion specialists: the protective coatings chosen must provide years of maintenance-free service and absolute resistance to corrosive attack by sub-soil moisture. Inspection and repair of buried tanks can be prohibitively expensive.

That's why five petroleum storage tanks, identical to that pictured above, were recently installed at a service station in Secaucus, New Jersey, after a costly failure of older tanks. Bitumastic No. 50 was chosen for heavy-duty protection of these tanks from sub-soil moisture in the loamy Jersey Meadow.

The surface of each tank unit was thoroughly cleaned, and then given a permanent covering of Bitumastic No. 50, the Koppers coating with tough, thick, water-resistant qualities for heavy-duty service.

The unique protective qualities of Koppers coal-tar coatings serve corrosion experts in almost every industrial and marine application. Bitumastic coatings have become synonymous with the finest form of corrosion protection available today. For information on the Bitumastic coating suited to your needs, send the coupon or write: Koppers Company, Inc., Pittsburgh 19, Penna. District Offices: Chicago, Los Angeles, Pittsburgh, New York and Woodward, Ala. In Canada: Koppers Products, Ltd., Toronto, Ontario.

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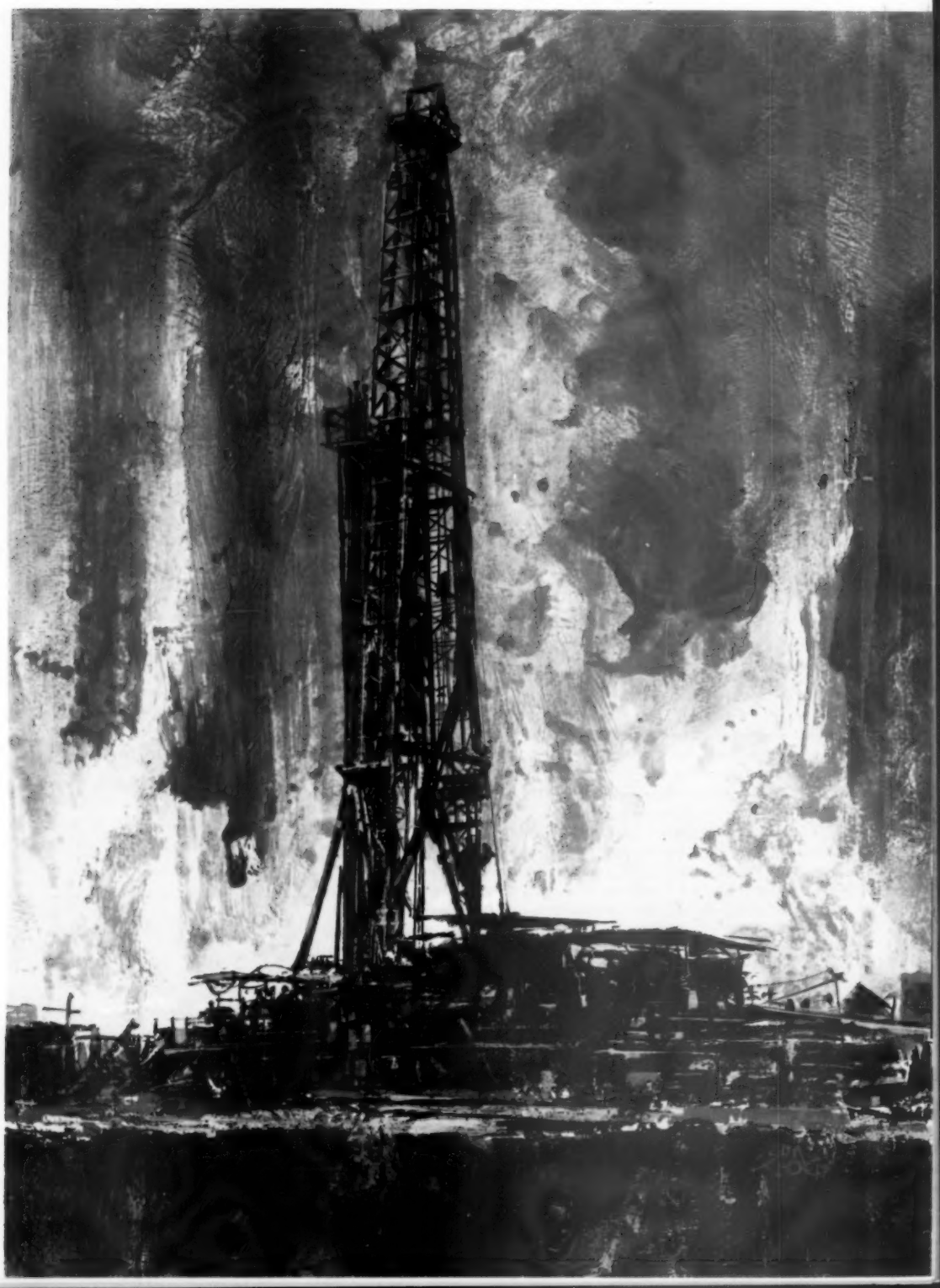

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There are reasons why Magcobar is called in on tough wells. Magcobar has the full resources necessary to come up with the right drilling fluids to solve problem wells, to keep routine wells from turning into problems.

There are reasons why you should use Magcobar on your next wells. When you're fighting the odds in drilling, you deserve the very best in drilling mud service. Get the very best from Magcobar, the company that has been elevated to leadership by the industry it serves.

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The World's Hottest Well / Magcobar helped break the heat barrier in this South Texas wildcat. A temperature of 460°F. was recorded at 14,556 ft. Drilling continued through a salt dome to a total depth of 15,107 ft. at this elevated temperature. Magcobar engineered the drilling fluids system, using a mud that could withstand high temperatures without gelation or cementation. The Ginther, Warren, and Ginther, O. W. Killam No. 1, near Laredo, Texas, is another example of how Magcobar engineering and the right Magcobar products solve problem wells.

Another **Well Done** with Magcobar Technology

Wireline Tools Set Magnetically

Subsurface tools now can be set at precise depths with a polarity-sensitive wireline device using magnetic rings.

Tools such as safety valves, bottomhole chokes, tubing plugs, and bottomhole pressure bombs can be placed with the device.

Max Raulings, senior project engineer for Camco, Inc., Houston, says that the equipment has been thoroughly proven in the field, successfully positioning several hundred subsurface tools of different types.

He says that the magnetic instrument will fix subsurface devices when there is mud in the tubing, and when the hole has a high deviation.

The device contains two major components—the Magnaset nipple, using magnetic rings and made up with the tubing string, and the Magnaset selector, which is lowered on the wireline with the subsurface tool that is to be set.

The landing nipple employs two magnetic-ring assemblies installed in its upper portion. The selector contains two polarity-sensitive, detector switches connected in series and spaced apart the same distance as the magnets in the nipple.

When the selector passes through the proper nipple, the magnetic rings activate it and cause it to set off an explosive-firing circuit.

The selector tool, which also carries on its lower end a locking and sealing device, is lowered into the well on a solid wireline. As it passes through the tubing and through the magnetic fields of the nipple, the detector switches close simultaneously, activating the circuit and setting off the charge.

The explosive sets a locking device that attaches the subsurface tool to the tubing.

The explosive charge—RDX, a form of black powder—forces down a mechanical device placed under the firing chamber in the selector. As this mechanical piston is forced downward, two sets of pins holding the subsurface tool to the selector are sheared off. The subsurface tool is thus freed under pressure and is set in place in the landing nipple.

There is a grooved section near the bottom of the landing nipple. As the lock and subsurface tool are forced away from the selector, metal prongs on the lock—called "dogs"—are forced outward. These metal prongs fit in the nipple groove, thus securing the lock and tool.

Raulings explains that the subsurface tool is installed in one quick motion, in contrast to the conventional method of mechanical jarring action.

The device can position as many as six downhole tools at different depths in a hole by using different magnetic settings for each nipple.

Says Raulings: "Because the selector is only actuated by passing the proper magnetic field in the proper nipple, there is never any danger of any downhole device, such as a safety valve or a bottomhole choke, being installed at the wrong depth.

As the wireline selector passes through the tubing and through magnetic fields of other nipples, he points out, the detector switches open and close separately. Only when it passes through a nipple having magnetic rings spaced the same distance apart as the selector switches do the switches close at the same time, thus activating the firing circuit.

Recovery of downhole tools is effected by orthodox jarring methods.

These same subsurface tools, along with the attached locks, can be removed by running a wireline down the hole with a pulling tool, stem, and jar.

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DU PONT *Petroleum Chemicals* NEWS

Number 107 in a series of bulletins for the Petroleum Industry

MARCH • APRIL 1961

TETRAMIX* offers new flexibility in choice and use of lead antiknocks

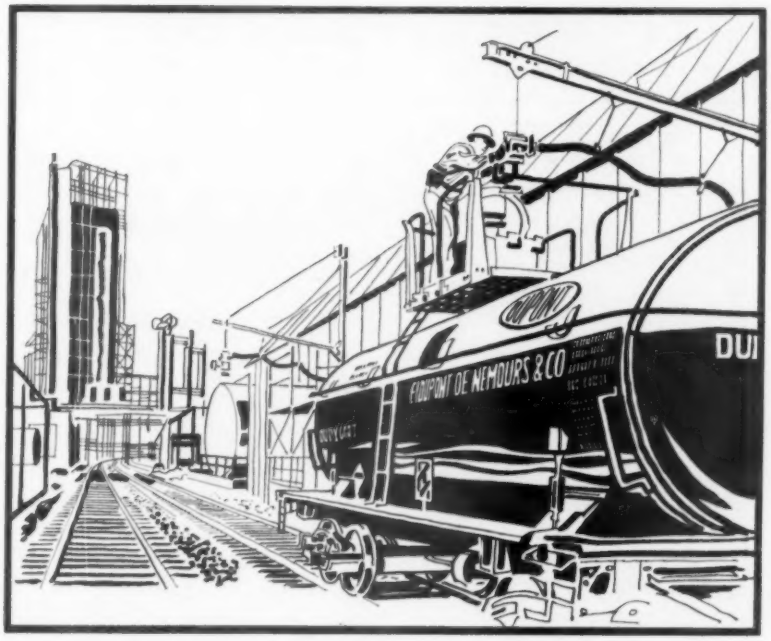
In the few brief months since the introduction of Du Pont TETRAMIX antiknock compound, refiners have found that it offers a new degree of flexibility in their choice and use of lead antiknocks. For example, while its effectiveness varies with gasoline composition (as is true with other antiknocks as well), TETRAMIX is generally effective in low, medium and high dosages.

Results of tests to date indicate that TETRAMIX is also a more effective antiknock in some fuels than either tetraethyl or tetramethyl lead —that is, a given octane number can, in such fuels, be obtained with lower concentrations of TETRAMIX than with TEL or TML. Being a mixed lead alkyl, TETRAMIX brings to many gasolines the best qualities of TEL and TML.

Based on this refining flexibility and the potential savings it offers in blending gasolines to desired octane numbers, TETRAMIX antiknock compound has already won refiners' acceptance. With commercial quantities available, now is the time for *you* to investigate the potential advantages of TETRAMIX.

Because you have a choice of lead antiknocks at Du Pont, you'll get impartial help in selecting the best one for *your* gasoline stocks. Your Du Pont Petroleum Chemicals Division representative can assist you in evaluating the relative merits of TEL, TML and TETRAMIX.

*Trademark



Commercial shipments of Du Pont TETRAMIX are now rolling to refiners.

All in the family

TETRAMIX, Du Pont's new lead antiknock compound, is a combination of all possible tetramethyl-ethyl lead compounds. It provides the best qualities of both TEL and TML in a single additive.

Announced in the fall of 1960, TETRAMIX represents the latest in a series of Du Pont petroleum additive developments that dates back to the commercial introduction of TEL in the early 1920's.

Now . . . 4,507 motorists in a nutshell

The "Summary Report" of the Du Pont "Profile of the Motorist" study is soon to be published. This new booklet will give you a nutshell version of the results of the most extensive survey ever made of the driving-and-buying American public.

In handy, concise form, this new publication will contain answers to questions about how people react to price wars, give-aways, trading stamps, regular vs. premium gasolines, TBA

ADVERTISEMENT—Prepared for the Petroleum Chemicals Division of E. I. du Pont de Nemours & Company (Inc.)

OVER

DUPONT *Petroleum Chemicals* NEWS

CONTINUED

4,507 motorists

purchases, credit cards, vacation driving and daytime TV . . . and many other facts that further define and analyze the motorist and the market he represents.

In the "Profile of the Motorist" study itself, 4,507 motorists were interviewed in marketing areas from coast to coast. The broad findings, trends and many cross-tabulations will be published in the "Summary Report." Comparisons with earlier DuPont surveys are also to be included.

Copies of the "Summary Report" will be available about April 1. For your copy or for information on the study itself, contact your DuPont Petroleum Chemicals representative.

MANAGER
GULF COAST REGION

CHARLES D. TOWERY, Manager of the Gulf Coast regional office for DuPont Petroleum Chemicals, has been associated with DuPont since 1947.

Starting as a sales service representative for the Petroleum Chemicals Division in the Gulf Coast District, he later was manager of the Mid-Continent region before moving to his present position.

Prior to coming with DuPont, Mr. Towery was employed by Bethlehem Supply Company of Houston, the Gulf Oil Corporation and the Pure Oil Company. He also served as a petroleum advisor in the U. S. Bureau of Ships during World War II.

He received a Bachelor of Science degree in Chemical Engineering from Texas A. & M. College in 1932. He and his wife live in Houston with their four children.

The many DuPont services are available to refiners and marketers in the Gulf Coast area through Mr. Towery's office — to aid in the solution of petroleum additive problems.

Color gives fuel oil a new selling advantage

Oil companies know that the subtle differences between competitive petroleum products often can mark a wide variation in their sales value to consumers.

One of these factors in fuel oils, for example, is the very appearance of the product. Consider the relative sales appeal of fuel oil in its normal state versus the same oil after a distinctive color has been added to it. Perhaps the burner is unaware of the difference, but marketers and consumers alike can recognize a difference. Such a distinction may be the sales advantage you seek.

To this end, DuPont petroleum dyes offer you several built-in features: an unlimited choice of colors, color-fastness for lasting value, availability in powdered, flaked or crystalline forms; rapid deliveries; experienced technologists to advise on color selection, application and use.

Your DuPont representative will gladly offer this advice—or provide you with our latest booklet on DuPont Petroleum Dyes.

"Down the Road" now appearing on America's screens

"Down the Road," the CinemaScope movie sponsored by DuPont to stimulate interest in auto travel, is now appearing in movie theaters across the country.

Narrated by Lowell Thomas, the ten-minute color featurette is an adventure in itself — a thrilling visit by automobile to all corners of America, from the Painted Desert to New England, from the sands of Daytona to the mountains of Canada.

In sponsoring "Down the Road" DuPont is promoting expansion of the demand for petroleum products by encouraging a greater interest in the heritage and beauties of America—and the ease and comfort with which they are available via automobile.

Motorists in *your* marketing area will soon be seeing "Down the Road." If you are interested in tying in with the travel promotion value of this film, your DuPont Petroleum Chemicals representative can give you data on local bookings.

RADIO CITY MUSIC HALL, New York City, was the site of the Eastern premiere of "Down the Road," in mid-January.

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San Francisco 4—111 Sutter St.	EXbrook 2-1934
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DuPont Lead Antiknock Compounds and other Petroleum Additives

OVER

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A-19007

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New Mexico Area Developing Fast

The two-pool Totah-Cha Cha area of San Juan County is currently the center of development activity in northwest New Mexico.

The Cha Cha and Totah pools lie along parallel northwest-to-southeast trends midway between Horseshoe Canyon to the north and the Angels Peak-West Angels Peak trends to the south-east.

The trends of these two pools are similar to those of both Bisti and Gallegos, the latter two lying from 9 mi. to 12 mi. directly south of the southeastern extremity of development so far at Cha Cha.

Although roughly only a mile and a half separates the Totah and Cha Cha trends, they currently are believed to be two separate reservoirs.

The first real interest in the area came in the summer of 1959, following completion of the well now regarded as the field discovery.

An earlier success in the area, in July, 1958, aroused little interest. This well, Pan American Petroleum Corp. No. 1 USA-Holder, section 21-28n-13w, was plugged back from the Dakota for completion in the Gallup, where it pumped 95 b/d through perforations at 5,508-685 ft. It lies at the extreme southeastern tip of the Cha Cha pool, as now developed.

The recognized Cha Cha discovery was Benson-Montin-Greer Drilling Corp. No. 2 Jones, section 17-28n-13w, located 2 mi. northwest of the Pan American Holder. It was completed for 132 b/d and the operator subsequently conducted a successful five-well development program to the northeast and north. This was the original Cha Cha pool.

Pan American and Aztec Oil & Gas Co. then did further drilling, brought production to within a mile of the original Pan American discovery. Locations offsetting this well currently are staked in the area.

Early drilling indicated two pools in the Cha Cha area, but subsequent drilling has joined them and the area has been officially ruled the Cha Cha pool.

During early Cha Cha development work, El Paso Natural Gas Co. spudded a Dakota test 4 mi. northwest at No. 1 Ojo Amarillo, section 27-29n-14w, but the Dakota was not productive, and El Paso plugged back, completing in the Gallup for 304 b/d through 18/64-in. choke and perforations at 5,322 ft.

This area for a time was referred to as Ojo, but later development by El Paso, Pan American, and Humble Oil & Refining Co. extended production to within a mile of the original Cha Cha pool.

Though the sands grow thin in the gap separating the northern (Ojo) part of the pool from the southern, production has been established within the gap. Several locations are staked there.

The entire trend has an over-all length of approximately 10 mi., but producing limits are not yet established at either end.

Totah development started in 1959 with drilling of the pool discovery, Tenneco Oil Co. No. 8 Glenn Callow, section 27-29n-13w. It flowed 514 b/d through ½-in. choke and perforations at 5,185-247 ft. Development has extended production at Totah northwest and southeast, along a trend paralleling that at Cha Cha.

The pool now extends some 4 mi. along the northwest-to-southeast trend and is a little more than a mile wide at its widest point. Additional work

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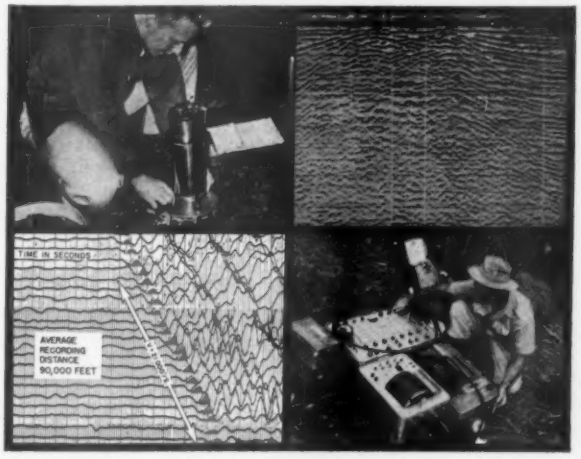

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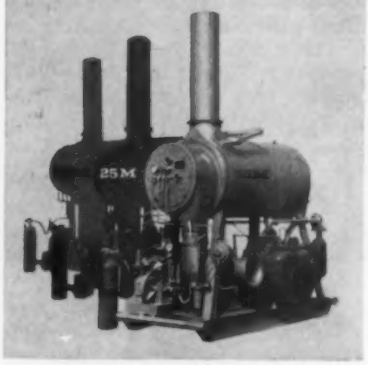

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is scheduled on the northwest, where producing limits are not defined.

Aztec, with 12 completions, and Tenneco, with eight, have been most active at Totah. Pan American has two completions and Southwestern Production one.

Dakota gas production has been discovered in the Totah pool, and several wells there have been completed dually.

Both Totah and Cha Cha pools produce from lenticular sands in the Gallup formation. There are two sand bodies in the area. The lower sand is found in the central and southeastern part of the Cha Cha pool, but generally is not found at Totah. The upper sand reaches a maximum thickness of approximately 20 ft. and the lower is 15 ft. thick at its thickest point.

Porosity runs from 12% to 16% and permeability ranges up to 300 millidarcies. Estimated reserves are 91 bbl. per acre foot, with a wide spacing program (160-acre) in the area. Average cost for completion of a well is $57,000.

Top unit allowable at Cha Cha is 164 b/d per well, giving the pool a current average of some 6,500 b/d. At Totah, the top unit allowable is 94 b/d, with the field allowable some 1,700 b/d.

What's New / IN PRODUCTION

Higher Rates in Effect On Federal Land

Rental rates for oil and gas leases on federally owned land will be higher from now on.

Interior Secretary Stewart L. Udall put into effect last week higher rates authorized by Congress last September (PW—Oct.14'61,p15).

The new rules extend primary terms of noncompetitive leases from five to ten years. Annual rental rates for noncompetitive leases will be increased to 50¢ per acre for the entire lease term. The old rates for noncompetitive leases were 25¢ per acre for the first year; nothing for the second and third years; 25¢ for the fourth and fifth years; and 50¢ for each succeeding year.

Leases now outstanding which receive five-year extensions will be required to pay the 50¢ rental for each year of extended terms.

Rental rates for competitive leases prior to discovery are increased from $1 to $2 per acre per year.

The new rates will affect lease offers that were pending Sept. 2, 1960, and do not affect leases issued or outstanding prior to that date.

The changes also affect acreage limitations for oil and gas leasing.

•

Novel Completion Made

Southern Natural Gas Co. has made a twin completion with two casings and two tubing strings in a single hole.

A company spokesman says the twin completion was made in the No. 14 Zonor in the Patterson field, St. Mary Parish, La. He said the twin approach was taken to eliminate the difficulties with workovers on dually completed wells in the area.

The well was drilled to 13,680 ft. and plugged back to 12,462 ft. One string of 4½-in. casing was set to 12,413 ft. and another to 12,406 ft. Both were cemented simultaneously. The operator ran 2⅜-in. tubing to 11,548 ft. in the deeper casing. In the other casing, similar tubing was set to the producing zone at 12,286-92 ft.

•

Custody of some 70% of Shell Oil Co.'s daily crude production in the Pacific Coast area is now being transferred automatically.

The company has installed 28 ACT units to measure and ship oil automatically in the past five years.

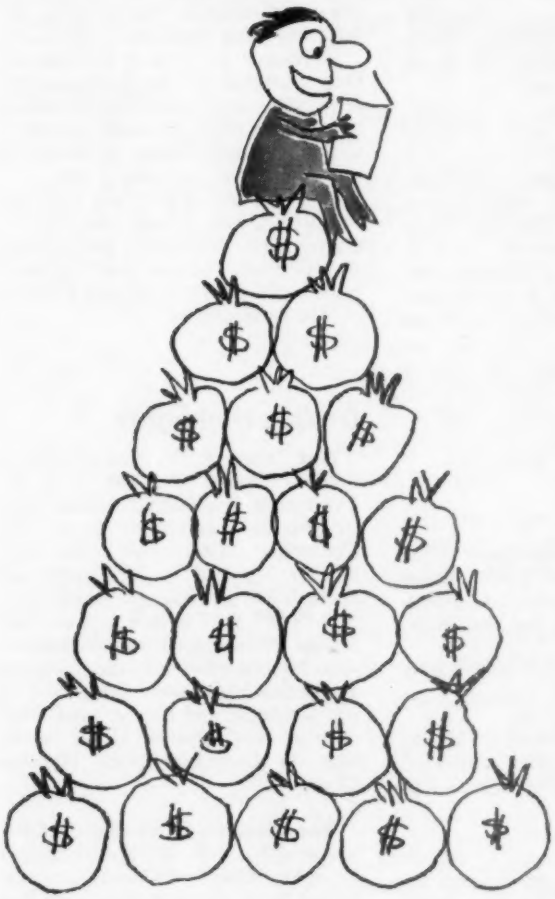
G. H. Holliday area development engineer for Shell, says more units will be installed during the next year, but ACT will not be used in all areas because "we haven't been able to justify it on very small leases."

•

The president of the Texas Independent Producers & Royalty Owners Assn. says he sees no present need for a legislative bill that would offset the Texas Supreme Court's decision in the Normanna case (PW—Mar.17 '61,p11).

John G. Hurd, in a special report to TIPRO directors, said he thought

Men who read more ...earn more!



Most of us recall at least one classmate who "never cracked a book", but somehow got by. Wonder where he is today?

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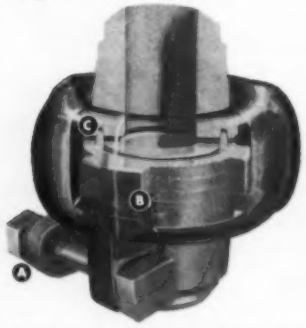

Note in the illustration above how the tightening of a single tee-head bolt (A) causes identical tapered interlocking shelves in the nut member and on the lug hub (B) to travel against each other. This leverage action exerts tremendous pressure on the seats and seal ring (C).

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the Texas Railroad Commission still had power to prevent large-tract gas owners from discriminating against small-tract owners, and that legislation was not needed. He cited Rule 37 exceptions and allowable factors through which the commission can require equity of production.

Says Hurd: "In the unlikely event that the commission should take some extreme course tending to 'repeal the law of capture,' then corrective legislation could be submitted with sound reasons for quick passage."

•

More than 5,000 acres of the eastern shore of tidewater Virginia have been leased by Siki Oil Co., Alexandria, Va.

The leases on the Northampton County land between Bridgeton and Kiptopeke are for ten years at $1 an acre.

There was oil leasing activity on the eastern shoe in 1942, with 300 acres involved, but nothing came of it. Only the southwest tip of the state has any current production.

•

The New Mexico State Land Office has received bids of $349,598 for 51,203 acres of oil and gas leases. The sale was termed the best in recent months.

Top bid in the sealed bid category was $24,269 for 640 acres in Eddy County, by Gulf Oil Corp.

U.S. Smelting, Refining, & Mining Co. submitted the highest sealed bid per acre, $88.44, for 160 acres in Lea County.

•

The Saskatchewan government accepted bids of $192,909 in a closed sale of provincially owned oil and natural gas leases, mainly in the southeast.

Consumers' Co-Operative Refineries, Ltd., made the high bid of $35,035 for 160 acres in the Workman district, near the North Dakota border.

The province offered 47 parcels. Bids were received on 17 parcels and offers on 13 others were rejected.

•

The Navajo tribal council will offer oil and gas leases on 14 tracts in the Aneth (Utah) area on June 2.

Royalties on the tracts in San Juan County will be 20%.

Paul Jones, tribal chairman, also has asked the Bureau of Indian Affairs to offer some 34,000 acres of tribal lands near Leupp, Ariz., on a competitive basis for an exclusive oil and gas prospecting permit to be issued, for a two-year period, to the highest bidder on the entire acreage.

•

Engineering

A chemical agent that is said to reduce oil friction loss by 30% to 70% has been developed.

Developed by Dowell Division of Dow Chemical Co., the agent, known as J105, reduces friction by supressing turbulence, which is usually prevalent in pumping low-viscosity oil or oils of any viscosity at high pump rates.

In a field test of J105 in a 6,000-ft. well with 2½-in. tubing, pumping 32-gravity crude at 10 bbl. per minute, the friction pressure was reduced from 3,600 psi. to 2,160 psi., a saving of 350 hydraulic hp.

•

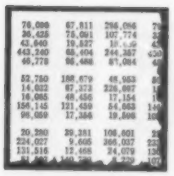
Drilling Highlights

East Texas—J. W. McFarland and Gibson Drilling Co. No. 1 F. L. Thompson, Alse Garrett survey, Leon County, was completed as a sub-Clarksville (Cretaceous) discovery, flowing 249 b/d of 36.2-gravity oil through ¼-in. choke and perforations at 7,134-40 ft. The well is 8 mi. east of the Normangee-Flynn Woodbine area. Nearest sub-Clarksville pay is gas production in Oakwood field, some 25 mi. northeast, and nearest sub-Clarksville oil production is 35 mi. northeast, in Grapeland pool, Houston County.

Pennsylvania—J. Sterling McCluskey et al No. 1 F. W. Brooky, Beaver township, Crawford County, was completed for 6-million cf/d on open flow through perforations at 3,721-59 ft. in the Clinton (Silurian). The wildcat is 5 mi. southwest of gas production.

West Texas—Ohio Oil Co. No. 1 Vinnie C. Liner, labor 21, league 30, Baylor County school land survey, Hockley County, flowed 207 b/d of 27.5-gravity oil through ½-in. choke and perforations at 7,368-69 ft., the lower Clear Fork. The discovery is 1½ mi. southeast of San Andres production in Levelland pool and 3 mi. northwest of North Claune Clearfork pool.

South Louisiana—Gulf Oil Corp. No. 1 Mark Delesdernier, section 5-23s, 31e, Plaquemines Parish, flowed 346 b/d of 37-gravity oil through 10/64-in. choke and perforations at 8,670-81 ft. The discovery is 2 mi. east of West Bay field.

The Market  Trend

PETROLEUM WEEK

April 28, 1961

On the Care and Prevention of Price Wars

The mood in Chicago is disenchantment these days. It's a wild and wooly market at best. To cap it all, this week, a mid-April hike in gasoline prices fell flat on its face.

The gasoline rhubarb started when an independent raised his prices 0.5¢ a gal. at the terminal level. He moved from 11.5¢ to 12¢ for regular-grade, hoping to erase an earlier 0.5¢ reduction.

The move looked like a good one for a few days. Chicago sellers said the inventory situation on gasoline was much improved. Demand was coming in strong. All that was needed was a little faith.

Two suppliers immediately announced similar increases. That put the score at three up and six down. If the other six followed, then the move was in the bag.

Then the gloom front blew in. Most of the major suppliers stood pat at 11.5¢. They reasoned that it wasn't possible to ask for 12¢ as long as jobbers had only 4.4¢ spread between the terminal price and the price at retail. One by one, the sellers who advanced recanted. The originator said he was rolling back because he met aggressive competitors at lower prices. So it was a question of either putt or get off the green.

Chicago sellers grumble that prices easily might have advanced for reasons of supply and demand. The retail situation looks worse than the stocks might warrant. Not much gasoline is pushing into Chicago from the Gulf Coast. Granted that private-brand competition is bad, but that's nothing new.

But the whisper was all over the market that everybody big was afraid to make a price increase. The South Bend price-fix case is too fresh in mind. Anything that costs consumers more money these days easily could be misconstrued by the Dept. of Justice.

So you wind up with the distressing problem: How do you end a price war? In Chicago, so free of wars for so many years, the prevention of cut-throat competition is a lost art today.

High LPG Stocks:

Look for trouble on LP-gas. Stocks at the close of March were 70% higher than those held a year earlier. Underground inventories alone came to a thumping 749-million gal., up 80% from a year ago. March production was up, too, running 14% above that of a year ago.

Cook County No. 6 Bids:

Bids to supply Cook County, Ill., with No. 6 oil were lower this year. Material Service offered 5.5-million gal. at 6.53¢ a gal., delivered in trucks. A year ago, the winning bid carried a maximum price of 7.03¢ in the summer, and 7.29¢ in the winter.

The Market Place

AROUND THE WORLD

Current key crude and product prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service, a McGraw-Hill Publication.

All prices as of April 24

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U.S. Gulf Coast, cargoes
- Gasoline, 98 oct prem....11.75-13.25
- Gasoline, 92 oct reg....10.75-11.5
- Kerosine....9.625-10.75
- Heating oil, No. 2....9-10
- Gas oil, 48-52, d.i....9.25-9.75
- Fuel oil, bunker "C"....$2.20-2.40

Caribbean, cargoes
- Avgas, Grade 100/130....14.75
- Gasoline, 93 oct research prem....10.875
- Gasoline, 87 oct research reg....9.5
- Gasoline, 80 oct research....8.75
- Kerosine....9.875
- Heating oil, No. 2....8.625
- Gas oil, 48-52 d.i....8.875
- Fuel oil, bunker "C"....$2.00

New York Harbor, barges
- Kerosine....10.95-11.4
- Heating oil, No. 2....9.95-10.4
- Fuel oil, No. 6....$2.62

Okla.-Group 3, northern shpt., bulk
- Gasoline, 91 oct reg....12.5-13.25
- **Kerosine....10.125↓-10.625**
- **Heating oil, No. 2....8.75↓-9.25**
- Fuel oil, No. 6....$1.60-1.90

Chicago, bulk
- **Gasoline, 92 oct reg....11.5↓**
- **Heating oil, No. 2....9.25↓-11.35**
- Fuel oil, No. 6 high sulfur....7.4

Los Angeles, rack
- Gasoline, 88 oct reg....10.8-12.65
- Diesel fuel, PS 200....7.75-11.25
- Light fuel, PS 300....$2.90
- Heavy fuel, PS 400....$2.10-2.45

Natural Gasoline, Grade 26-70
- FOB Group 3....4.5
- FOB Breckenridge, Tex....4

LP-Gas
- Propane, Oklahoma (Group 3)....3.5-4
- Propane, Baton Rouge....4.625

Pennsylvania Lubes
- Bright stock, 25 p.t....26
- 200 vis. neutral, 25 p.t....28

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 v.i....26-27
- Neutral solvent, 200-210 vis....23-24

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i....26-27
- Neutral, solvent, 200 vis....23-24

Eastern Hemisphere

Singapore (Pulau Bukom) cargoes
- Avgas, grade 100/130....15.75
- Gasoline, 79 oct research....9
- Kerosine....9.75
- Gas oil, 48 d.i. minimum....9

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, (Okla.-Kan.), 36.0-36.9....$2.69-2.97
- North Dakota, 36.0-36.9....2.47-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9....3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9....2.92-3.22
  - West Texas, sweet, 36.0-36.9....3.00
  - West Texas, N.M., inter., 36.0-36.9....2.93
  - West Texas, N.M., sour, 32.0-32.9....2.71-2.85
  - East Texas, flat....3.05-3.25
  - Mirando, 28.0-28.9....2.96-3.31
- Illinois Basin, flat....3.00
- Pennsylvania Grade, Bradford dist., flat....4.80
- California, Signal Hill, 21.0-21.9....2.33†
- North Louisiana-Arkansas, 36.0-36.9....2.72-3.02
- Wyoming, sweet, 36.0-36.9....2.85-2.90
- Wyoming, sour, 32.0-32.9....2.63-2.71

Canada (flat prices, at the well)
- Pembina (Alta.)....$2.38
- Leduc-Woodbend (Alta.)....2.53
- Redwater (Alta.)....2.42
- Steelman A (Sask.)....2.425
- Virden (Man.)....2.285

Venezuela (Cargoes, FOB lifting port designated)
- San Joaquin, 41.0-41.9, Puerto la Cruz....$3.10
- Oficina, 35.0-35.9, Puerto la Cruz....2.80
- Tia Juana, Medium, 26.0-26.9, Amuay....2.30
- Bachaquero, flat, La Salina....1.85
- Lagomar, 31.0-31.9, Cardon....2.55
- Lagunillas Heavy, flat, La Salina....2.07

†Differential per deg. of grav. varies

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura....$1.80
- Safaniya, 27.0-27.9, Ras Tanura....1.47
- Iran, 34.0-34.9, Bandar Mashur....1.78
- Iran, 34.0-34.9, Abadan....1.73
- Iraq, 35.0-35.9, Fao....1.72
- Kuwait, 31.0-31.9, Mina-al-Ahmadi....1.59
- Qatar, 41.0-41.9, Umm Said....1.95
- N. Zone, Burghan, 23.5-24.4, Mina Saud....1.48
- N. Zone, Ratawi, 23.5-24.4, Mina Saud....1.41
- N. Zone, Eocene, 16.5-17.4, Mina Saud....1.28

Middle East, Eastern Mediterranean
- Arabia, 34.0-34.9, Sidon....$2.17
- Iraq, 36.0-36.9, Tripoli, Banias....2.21

North Africa, Bougie, Algeria
- Hassi Messaoud, 40 and above....$2.65

KEY TANKER RATES

(Last paid, per long ton, single voyage)

- U.S. Gulf-New York, clean....(ATRS—27½%) $2.07
- U.S. Gulf-New York, dirty....(ATRS—30%) $2.00
- NWI-USNH, dirty....(ATRS—60%) $1.10
- NWI-UK/Cont., dirty....(Scale—60%) 13/1*
- Persian Gulf-UK/Cont., dirty....(Scale—52½%) 29/6*
- **Persian Gulf-USNH, dirty..(USMC—80%) $2.54↓**

**Sterling*

California Independents Vote To Drop Fight for 2c Differential

They decide to settle for a 1c gap between their gasoline prices and those set at major-brand stations.

The 2¢-a-gal. differential in California may be dead. Independent marketers in the state have voted to abandon this spread between their own gasoline prices and those posted at major brand stations.

They will try to learn to live with 1¢ instead.

The tradition-shattering move took place at the spring meeting of the California Petroleum Marketers Council in San Francisco.

In what one member called a "surrender," the independent marketers decided to accept what had already become fact.

The long-accepted 2¢ gap between independent prices and those set by major companies had shrunk to one cent. To try to re-establish the 2¢ margin, the council members agreed, would only lead to renewed price warring on the West Coast.

The CPMC meeting, which was boycotted by major-affiliated distributors, took place during what has become California's most critical period.

The California market has broken down into a three-way feud in the midst of the fastest-growing demand anywhere in the nation.

Marketers that sell exclusively under a major brand have challenged the right of their major competitors to price 2¢ below market at their private-brand stations (PW—Mar.17'61,p44).

Independent marketers, in the meantime, can't get either side to accept their claim to a 2¢ differential. Whenever they try, they find themselves caught in the teeth of a price war.

Despite the distributors' near-unanimous acceptance of the 1¢ differential (only one distributor voted against it), it is clear the move is not popular with the independents.

They consider it harsh medicine to have to take, and are concerned about two serious questions:

- Will all independents, including those not present at the meeting, agree to take the strong medicine faithfully, resisting the temptation to dilute it with sales gimmicks?
- If taken as directed, might the prescription kill the patient? In other words, can the independents successfully compete with the majors when their prices are only one cent higher?

There is still doubt that the majors will accept the 1¢ spread—refraining from insisting on par pricing.

But some evidence indicates they will: Dan Lundberg, CPMC's public relations counsel, told the council that past market performance indicates major companies in California will not try to close the gap between their prices and those of the independents—as long as the gap is only 1¢.

Lundberg, who proposed acceptance of the one-cent differential to the distributors, said he would have preferred that the semi majors (those owned or supplied by major companies) had themselves accepted a 1¢ differential in the first place. Presumably this would have avoided the costly price wars.

Speaking for the independents, he said: "There is no question in my mind that they need two cents, but they now need a period of stability even more."

Whatever their reservations about accepting a 1¢ differential, the California distributors found themselves without hope of receiving any help from government sources to assist them to an alternative solution.

Assemblyman Bruce Allen (R., Los Gatos) told the Council frankly that "there is no magic wand in Sacramento."

"We're not going to fix the price of gas[oline] by legislation," he said flatly. "Nobody in the legislature would vote for a bill that could be interpreted as anticonsumer legislation."

When asked about the state law fixing the price of milk, Allen rejected any possibility that it could be applied to gasoline. The milk law, itself, had caused problems, he said, and to put the giant and complex oil industry under a similar program would be almost inconceivable.

Even though it might want to help, the California government is hobbled by a lack of cooperation as well as by the legal factors that militate against antiprice-war legislation.

This was brought out by Allen's comments on the "ineffectiveness" of state government hearings.

Of the major companies, Allen said: "They send down lawyers who talk their private legal language for half an hour and leave us still in the dark."

But the distributors aren't much help either. When they get to the witness stand, they "often forget what it was they told us earlier to start the investigation," he said.

"Our source of information has been largely scuttlebutt, rumors and

No Laws Broken By California Price Cutters

State Attorney General Arnold Mosk could find no violations of state law in his 30-day study of California price wars, which was completed last week.

He did, however, indicate that California's Unfair Practices Act might be more fully enforced if dealers had greater freedom in setting their own prices.

The uncontrolled uses of rebates and discounts have blurred tankwagon prices, Mosk's report suggested, making it difficult for dealers to determine their costs and set their own prices.

To overcome this, Mosk recommended that suppliers be required to "state a true and actual" tankwagon price.

In addition, Mosk would outlaw those pricing practices obtaining at consignment stations. At these stations, suppliers rather than dealers set prices.

Mosk would have these stations become either out-and-out company stations (run by salaried employees) or true lessee stations where the dealer sets his own prices.

hallway stuff. We can't legislate on the basis of scuttlebutt," the Assemblyman said.

Allen did note that there is a price-war bill now pending in the California legislature. It would amend the state unfair-practices act by declaring discriminatory rebates illegal whether or not they are made in secret.

But he predicted no immediate relief from this source.

Allen also placed little hope in his resolution calling on the state attorney general to investigate the current California price wars.

Later in the week, it turned out, Assemblyman Allen proved correct (box, page 37). In a 30-day investigation, the attorney general encountered no violations of state law.

Computer Planned That Will Automate Oil-Heat Deliveries

Oil heat jobbers, largely bypassed by the trend toward electronic data processing, learned last week about a computer to be designed especially for them.

The Fuel Dispatch Computer, still on the drawing boards at Lockheed Electronics Co., Metuchen, N. J., will offer jobbers a way to prepare delivery schedules in a fraction of the time it now takes.

Not only will the computer sort out accounts that (according to the degree-day system) are running out of fuel, but it will arrange them in geographical zones and in order of delivery within each zone.

In addition, the computer will classify customers according to type of account (credit or c.o.d., for example) and provide a reading on any single account whenever it's asked.

It will search its memory drum for accounts that were inadvertently overlooked by the dispatcher, and will provide periodic summaries of deliveries.

A spokesman for Lockheed Electronics, a division of Lockheed Aircraft Co., spoke to oil-heat jobbers last week at the Oil Heat Institute's 39th annual convention in Washington, D. C.

He told them that a single clerk will be able to operate the computer. Besides typing in requests for information, the clerk's only manual chore is to keep the computer current on deliveries accomplished each day.

Lockheed feels that the machine can be helpful to jobbers with as few as 1,000 accounts.

What's New / IN MARKETING

Sun Oil Co. may be playing a different promotional tune this year: It's planning to "pull out all the stops" in its custom-blending pumps and market nine grades instead of six.

It's just "another way of exploring the various possibilities of meeting private-brand competition," Willard W. Wright, senior vice-president, told the company's stockholders last week in Philadelphia.

Sun would try out the nine grades in single market first, perhaps in Wilmington, where Sun already has a nine-grade pump (PW—Dec 23'60, p36).

•

Shell Oil Co. intends to house all of its marketing accounting east of the Rockies under one roof—at a new data processing center in Tulsa.

Beginning this summer, Shell will centralize credit-card operations at the center, and, by the summer of 1962, will install an IBM 1401 to expedite sales and payroll accounting, as well as credit card handling.

Shell's West Coast accounting is being centralized at San Francisco (PW—Mar.31'61,p43).

•

A campaign that plugs Florida and stresses how cheap it is to get there—by car—is about to be unleashed by Pure Oil Co.

Pure sent a family of four from its own hometown, Chicago, to Florida and back, all of 3,275 mi., and totaled the transportation costs. They came to $86.92.

Compare this to an estimated $367 by plane, $268 by train, and $214 by bus, says Harry Moir, Pure's marketing vice-president.

•

API's Travel Development Committee—not yet a year old—is already telling governors how to increase tourist traffic in their states.

Last month, James G. Bennett, the committee's coordinator, gave governor Farris Bryant of Florida, a ten-point program for improving travel to the state.

And last week, Bennett journeyed into Nebraska to help Governor Frank Morrison initiate a travel program.

And when Bennett returned to New York, he found invitations pouring in from the governors of Iowa, New Hampshire, and North Dakota, all seeking to boost tourist travel to their states.

Through Bennett's efforts, and the work of TDC, the oil industry is filling a void on the national travel horizon. As Bennett says, "there just isn't anyone that provides this kind of help to states that want to increase their tourist appeal."

A big feature in Bennett's plan for Florida is a national department store promotion that would highlight the Sunshine State in store windows, interior displays, and newspaper advertising.

For Nebraska, Bennett carved out the groundwork for a travel-trailer rally, drawing upon the cowboy-and-Indian attractions of the state for atmosphere and entertainment.

Besides these domestic programs, TDC is also working with international airlines to help them boost tourist travel to the U.S.

•

Something that looks like bedlam is about to hit the Oklahoma-brand service stations in the Midwest. At least, that's what motorists are led to believe.

"Don't be surprised if the next time you see an Oklahoma station it looks as if bedlam has replaced our usual quiet efficiency," the motorists are being teased in advertisements.

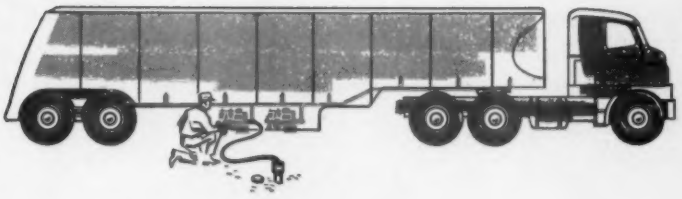
What's the fuss? Humble Oil & Refining Co. is about to change th Oklahoma brand to Enco, following a trend it has set in other parts of the country.

•

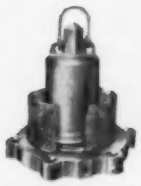
Standard Oil Co. (Ind.) reasserted last week that it has extended the brand name "American Super-premium" to the East.

In its original announcement last year (PW—Jul.22'60,p44), the company had declared that American Premium would signify its top brand in the former Amoco markets. This has been revised to conform with the company's brand names everywhere.

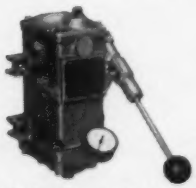
The company also noted that its additive symbol, M_2PG, which may be used throughout the country (PW—Apr.7'61,p55), means "more miles per gallon," and that "twice as much per gallon" is too literal a translation of the symbol.



take a load off your mind...



Hydraulic internal valve



Hydraulic operator pump-type model

Hydrafold valve

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Field Use of Multifuel Engines Grows

Multifuel engines are rapidly becoming popular in the U.S. There are now multifuel engines that can use several liquid fuels, multifuel gas engines, and even combinations of the two.

Multifuel liquid engines have reached a high degree of development in Europe. There, they are developed chiefly for the military requirements of NATO. Multifuel gas engines in Europe are a more recent development, but a very promising one.

The liquid multifuel engine is being developed in this country for reasons of economy as well as for national security.

The thought behind their development is this: While the greater economy of diesel engines is desirable, the many existing spark-ignition engines must also be supplied with fuel; it is therefore unlikely that either diesel fuel or gasoline will become the universal fuel for many years to come. As a result, new engines should be capable of using either of these fuels with equally satisfactory efficiency.

Furthermore, in time of national emergency, the ability to burn either fuel makes for better utilization of available supplies.

And during military operations, it enables the Army to "live off the land" with less difficulty.

The work that is being done on various types of multifuel engines, and their applications to several uses, was discussed in a symposium during the recent Oil & Gas Power Conference of the American Society of Mechanical Engineers, in New Orleans.

MULTIFUEL ENGINE, developed by Continental Aviation & Engineering Corp. for U.S. Army Ordnance Corps, has a spherical combustion space in piston head, and a swirling air intake port, for slow, progressive combustion.

The liquid multifuel engine is generally of the diesel type, but also capable of burning gasoline. One of these is now in an advanced stage of development for the Army.

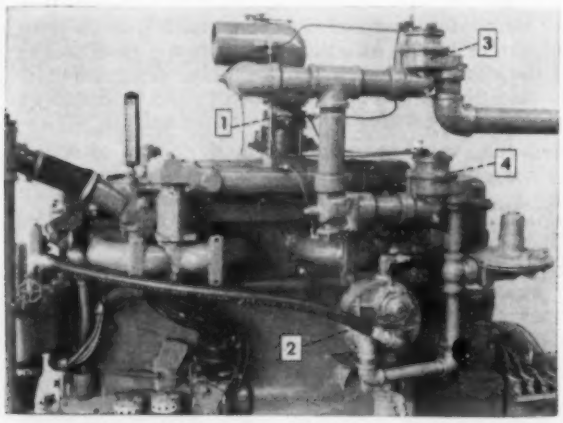
Walter F. Isley, chief engineer of Continental Aviation & Engineering Corp., described to the ASME meeting the features of its Hypercyle LDS-427 engine. It is the American counterpart of the German MAN "M"-type multifuel engine, and it uses a new method of "controlled combustion."

In this engine, the fuel is sprayed against the wall of a spherically-shaped combustion space, located in the crown of the piston (picture). Through the use of special intake ports, induced air is given a swirling motion, which persists during combustion and continues to supply oxygen to the slowly evaporating fuel. This, Isley said, assures smooth, knockless combustion, clean exhaust, and high efficiency.

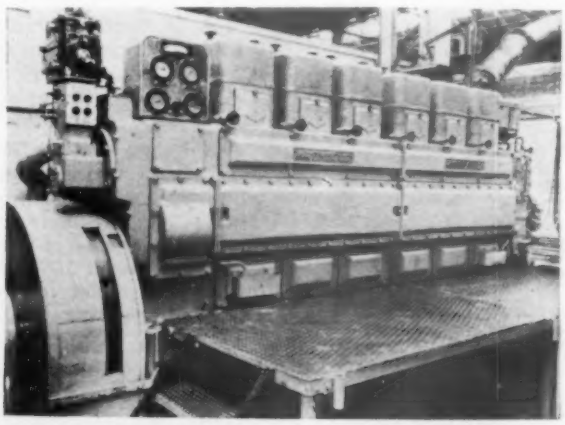
Some of these engines have been installed in Army M35 2½-ton trucks, and subjected to extensive field testing, under extreme conditions of climate and terrain. Over 360,000 mi. of operation have been accumulated on these trucks, Isley explained, at Army sites in states including Alaska (with —40F weather) and Arizona (with 115F heat).

The tests have shown that diesel fuel, JP-4 jet fuel, and gasoline all operate satisfactorily in these multifuel engines.

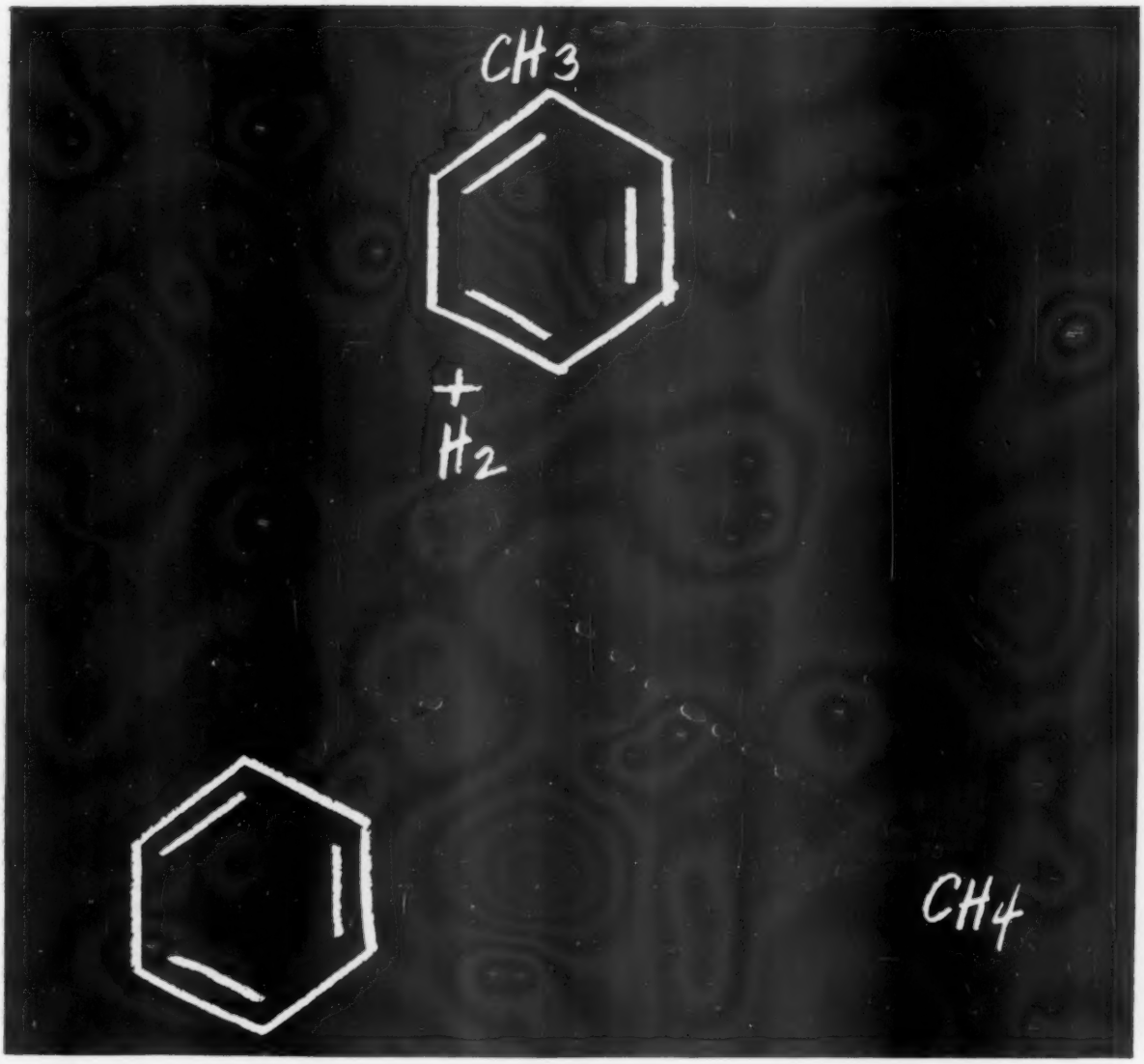
The fuel consumption, in these tests, stays very closely related to the weight of the fuel per gallon—in other words, to the heat content of the fuel. A loss in acceleration is noticeable with gasoline, Isley said, but performance equals or exceeds



HALL SCOTT 6-CYLINDER GAS ENGINE is equipped with an American Bosch system, to switch from low-cost waste gas to LPG. It has a standard carburetor (1), an LPG vaporizer (2), low-Btu-gas (3) and LPG (4) metering regulators.



HEAVY-DUTY DUAL-FUEL ENGINE, made by Kromhout Motoren Fabriek, in Amsterdam, can use efficiently either liquid fuel or fuel gas to which a small amount of diesel fuel is added. This principle is now also used in the U.S. and Canada.



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- DETOL process also converts non-aromatics and organic sulfur compounds—if present in feed—to light hydrocarbons and hydrogen sulfide.
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that of a standard gasoline vehicle. High engine speeds and a high degree of supercharging have resulted in substantial increases in performance.

Similar development work has been going on with multifuel gas engines, so that any type of combustion gas can be used efficiently in the same engine.

At the ASME meeting, C. E. Holvenstot, chief engineer of Ingersoll-Rand Co., reported on extensive tests conducted by his company to compare the performances of natural gas and its components, used singly or in mixtures, in a 4-cycle spark-ignition engine running at 550 rpm.

His conclusions: With optimum spark setting, propane, normal butane, and isobutane show about the same fuel consumption, which is somewhat better than the consumption of natural gas (96.2% methane). But to avoid detonation, the butanes must be used with a retarded spark, which reduces their efficiency and maximum power obtainable.

Commercial use of hydrogen as fuel, Holvenstot said, even when it is easily available, is not practical, because of combustion roughness and backfiring. One interesting sidelight on hydrogen operation is that the combustion chamber soon becomes completely free of carbon deposits, as if cleaned—although brownish in color. The presence of an inert gas in the combustion gases was also studied. It was found that any reasonable amount of inert gas (such as nitrogen) does not harm engine operation, as long as enough gas fuel can be induced into the cylinder, and the mixture of gas fuel, inert gas, and air remains within the limits of inflammability.

As a result of this technical work, it is now possible to shift from one type of gas to another to take advantage of the most economical supply. A special device has been developed to make this change possible, and maintain high efficiency with either gas.

The American Bosch division of American Bosch Arma Corp. has developed a regulator that can switch a spark-ignition engine from a high-cost fuel to a low-cost byproduct gas, and vice-versa, according to their availability.

R. G. Abbott, American Bosch chief engineer, described several applications of the device at the New Orleans meeting.

Several West Texas oil drillers, Abbott reported, are using the device (picture, page 40). They burn low-heat-value natural gas from the wellhead during normal drilling periods, and switch to high-Btu. LPG when more power is needed, for example to come out of the hole. The switch from one fuel to another, and back, is accomplished by means of air-operated valves, and does not take over two to three seconds.

And finally, multifuel engines that can burn either gas or liquid fuels equally well are now available. They are referred to as dual-fuel engines, because a small quantity of liquid fuel must be used, even when the engine operates on gas.

Dual-fuel engines are now available in a wide variety of sizes, for many applications, up to 500 hp. (picture, page 40).

Erik Kelgard, of Trans Mountain Oil Pipe Line Co., Kamloops, B.C., Canada, explained at the Power Conference how his company operates 16 of its 24 diesel engines (driving centrifugal pumps) on the dual-fuel principle. As the feed governor on the engines does not follow the same line on gas and on oil, a gadget, called a "ratio controller," had to be installed, to change the gas supply pressure when the load changes.

A substantial reduction in the quantity of air used for burning the fuel must be made when natural gas is used instead of oil. The wide range of temperature encountered in Canada (from 100F to —50F) must also be taken into consideration, Kelgard explained; this is done with special air precoolers and preheaters.

The dual-fuel engine provides good fuel economy, with savings up to about 20%, as well as reduced maintenance costs, according to Kelgard. "If steps are taken to keep the air-fuel mixture at the best value consistent with good engine maintenance," he said, "the dual-fuel engine is the most economical and reliable prime mover in use in pipeline service today."

Active development of multifuel engines is also being pushed actively in Russia today.

The Office of Technical Services of the U.S. Dept. of Commerce has available a translation of a paper discussing the development and utilization of multifuel engines there for land, sea, and air transport.

More Knowledge of Asphalt Needed

When the seal coating of an asphalt pavement fails, it is seldom the quality of the asphalt that is to blame for the failure. More likely, it is because the wrong kind of asphalt was used on the job.

The applications of asphalts to highway pavements were discussed at the recent asphalt symposium of the Western Petroleum Refiners Assn. in San Antonio.

In Kansas, R. L. Peyton, assistant State Highway engineer pointed out, almost any type of asphalt is used, and gives good results. Included are several grades of asphalt cement, some emulsions, several grades of rapid-curing, medium-curing, and even slow-curing cutbacks.

One of the most frequent causes of failure of asphalt seal coatings on a pavement is the lack of knowledge of the properties of the asphalt employed, according to Peyton.

Most important of these properties is the viscosity (or fluidity) of the grade of asphalt selected; or its penetration, when it is an asphalt cement.

The curing time, which depends on the type and quantity of diluent in the asphalt, is also an important factor. It varies substantially with weather conditions.

Actually, in highway construction practice, the optimum grade of asphalt must be selected to match the available aggregate and the existing construction facilities.

"In most cases," H. K. Nevitt, international asphalt and highway consultant, of Kansas City, Mo., told the symposium, "the aggregates are those that are available locally. And you can't easily change the application equipment. The easiest thing to select —providing you know your asphalts —is the right kind of asphalt to do a satisfactory job."

To avoid failures, and costly corrective maintenance later, preventive maintenance should commence immediately after construction of an asphalt pavement is completed, B. A. Vallerga, director of products engineering, Golden Bear Oil Co., told the WPRA symposium.

Unfortunately, a preventive maintenance program is far more difficult for asphalt suppliers to sell to those who control the expenditures of funds than a corrective program. Therefore, Vallerga said, most pavements are usually allowed to reach a state of distress before they are given adequate attention. Corrective maintenance, in such cases, is substantially more costly.

A novel material has recently been developed to penetrate dry, weathered asphalt surfaces, and replasticize the asphalt, Vallerga disclosed. It is an oil-resin emulsion, and it holds great promise in preventive maintenance.

What's New / IN PROCESSING

Ethyl Corp. has doubled production capacity for its ortho-alkylated antioxidants. The expansion will also enable Ethyl to produce other industrial ortho-alkylated chemicals.

Among the antioxidants produced by Ethyl's patented ortho-alkylation process are:

- Ethyl 702, used by lubricants for motor and aviation piston engines, and for railroad and marine diesels.
- Ethyl 703, used in jet engine oil, industrial oils, and greases.
- Ethyl 733, used in motor and aviation gasolines and jet fuels.

•

Tidewater Oil Co. and Air Products, Inc., will jointly build an oxo alcohol plant adjacent to Tidewater's Delaware refinery.

Initially the plant will produce isooctyl, decyl, and tridecyl alcohols; other products will be manufactured later. Total capacity is expected to be more than 60-million lb. per year.

Tidewater will supply the raw materials and operate the plant, and Air Products will provide design engineering and handle product sales.

•

Foster Wheeler Corp. will construct a liquid propane unit for Quaker State Oil Refining Corp. at St. Mary's, W.Va. Completion is expected by the end of 1961.

A lubricating oil filtering plant is also under construction at St. Mary's, and should be completed in July. It will replace facilities that were destroyed by a fire in January.

The entire construction program will cost about $1-million.

•

Pure Oil Co. is building an extraction unit at its Lemont (Ill.) refinery. Completion is scheduled for November; capacity will be 26-million gal. a year.

•

A polystyrene plant is being built at Leghorn, Italy, for Dow Chemical International, Ltd., S.A. Foster Wheeler Italiana is the contractor; Dow Chimica Italiana S.P.A., Milan, will be the operator.

Its facilities for producing Styron, Dow's trademark for polystyrene, will include polymerization units, coloring facilities, quality control laboratories, and technical service laboratories.

Initial production is scheduled for 1962. Eventual capacity will be 16,000 tons per year.

•

Significant changes are taking place in the specifications for diesel fuels for the U.S. Navy. A single type of marine diesel fuel, with a 47-cetane rating, will be specified, and JP-5 jet fuel will be acceptable as diesel fuel, to the extent that it is available and logistically justified.

Specification MIL-F-16884 is presently being revised to eliminate Type II marine diesel fuel (arctic type), and it is likely that a separate specification will soon be written for cracked fuel, which heretofore was not acceptable as diesel fuel in the Navy. All these diesel fuels will also be used for gas turbines.

Eugene C. Davis, of the Navy's Bureau of Ships, discussed these new developments at the recent ASME Oil & Gas Power Conference, in New Orleans.

•

Engineering

An automated catalyst analyzer developed by Gulf Research & Development Co. makes it possible to determine automatically the surface area of a catalyst, at a saving of about 14 man-hours per sample.

The analyzer evacuates all the air from the catalyst, cools it to —319F, and refills it slowly with controlled amounts of nitrogen, until atmospheric pressure is reached. It is assumed that this condition is reached when the catalyst pores are completely filled.

Then the device reverses the cycle, and the nitrogen is removed—while careful record of the pressure changes are taken.

When all the nitrogen has been removed, the data is fed to a computer, which calculates the total surface area of the catalyst, the pore volume, and size distribution of the pores within the catalyst.

A single pound of catalyst, Gulf researchers say, contains a surface area equal in size to that of thirty football fields.

Gulf has licensed the new analyzer to American Instrument Co., Silver Spring, Md., which will manufacture and market a commercial model.

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Automatic Welders Speed Pipelaying

Automatic welding of joints of line pipe with machines that rotate around the pipe may soon become commonplace. Two such machines have just been perfected, and another is being tested.

Equipment that will automatically weld pipe that is rotated has been in existence for some time. But because the pipe must be rotated, the units are impractical for field use.

Designing an automatic welder that will work on stationary pipe has been a priority project of pipeline construction and welding experts for years, and their efforts are now paying off.

The advances made in this area were among the significant developments in pipelining cited by Fred S. Jones, of Platte Pipe Line Co., at this week's Pipeline Conference of the American Petroleum Institute, in St. Louis.

Last week, one of the existing machines was featured at the annual meeting of the American Welding Society, in New York City.

The main attraction in an automatic operation is that welds can be made much faster than they can manually—and with less manpower.

Increasing the rate of welding, of course, speeds up the whole pipelaying job, thereby cutting over-all costs.

A machine developed by H. C. Price Co., in cooperation with Crose-Perrault Equipment Corp. and Hobart Brothers Co., is reported to be able to join two sections of 36-in. pipe in less than eight minutes.

This is the unit that Price is using for double jointing pipe for the gas line being constructed from Canada to the San Francisco area (PW—Mar.31'61,p35).

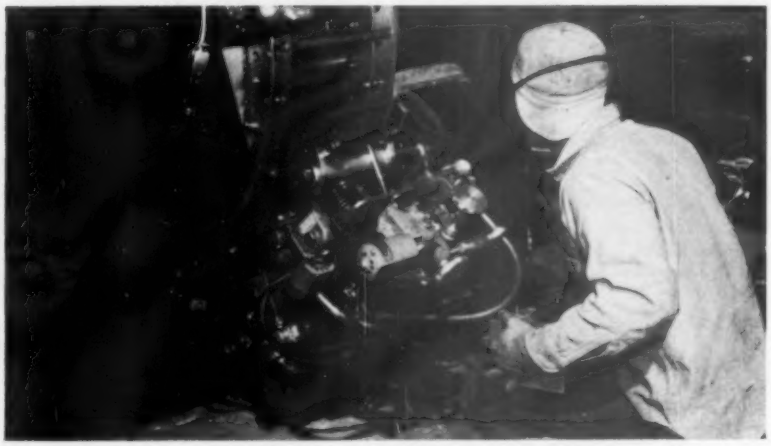
The pipe is API 5LX Grade X52 and is 7/16 in. thick.

Hobart Brothers reports that the pipe is accepted as welded, with no cleaning and grinding necessary.

In addition, the welds meet API codes, the company says.

The welding procedure is simple, and the machine is so light it can be positioned by two men.

These are the steps involved in joining two sections of pipe: The pipe ends (which are beveled) are lined up and held firmly in position with a single hydraulic internal line-up clamp. The machine is positioned over the joint by two men, or a side-boom tractor. Travel speed of the machine, amperage, and voltage are preset. The operator then visually lines the unit over the joint, adjusts the electrode position, and turns the machine on.



WELDING HEAD of gas-shielded unit used to join sections on West Coast gas pipeline.

The unit uses a gas-shielded arc process—known as the Hobart Micro-Wire Welding Process.

The gas is carbon dioxide.

Esso Research & Engineering Co., which recently jointly developed a prototype machine that welded pipe up to 8-in., now has a unit suitable for 16-in. pipe.

Esso estimates that with a larger machine of the same kind, a single-pass weld on 30-in. pipe could be made in two minutes.

The company is now designing a welder that, it says, probably will be suitable for pipe up to 36 in. in diameter, and expects to have it built by the end of the year, according to Esso's H. C. Cook.

Other features of the machine listed by Cook are that welds are made without the use of a backup and "excellent" root fusion and root contour are obtained.

The welds meet all API mechanical test and radiographic specifications, according to Cook. He adds that Esso's welder can be used on all grades of pipeline steel, including B, X42, X46, and X52, and is also expected to be readily adaptable to high-strength steels now in development.

The unit operates on a modified carbon-dioxide-shielded consumable-electrode arc-welding process.

A machine that is expected to slash manpower requirements on a welding job by 50% is being field-tested by Linde Co., a division of Union Carbide Corp.

Linde hopes to be able to take the wraps off its unit in the fall.

A spokesman says, "It's estimated at this time that use of this machine will reduce total welding manpower requirements by about 50%."

Other than that, all the company will say about its welder at this time is that it will be suitable for "big-inch" pipe, it weighs 700 lb., and it will be mounted directly on the pipe and produce a uniform weld bead as it automatically circles the joint.

Still another new welding process—one that should probably be described as mechanized rather than automatic—is being readied for field tryouts by the Petroleum Equipment Branch of the U.S. Army Engineers Research & Development Laboratories, at Fort Belvoir, Va.

The technique is now reportedly producing "consistently" good laboratory welds.

Among the many interesting features of the operation, perhaps the most striking is that it doesn't use rods or flux. Instead, joints are forged together under great heat and pressure.

Here's how the method works: First, the ends of the pipe must be milled to assure uniform peripheral contact and otherwise processed to make them perfectly concentric.

Second, the ends are pressed together with a force of approximately

2,900 lb. per sq. in., and an induction heating ring is moved over the joint. The coil, producing a temperature of 2,600F, is left on the joint for 25 seconds. And then a hydraulic ram, producing 500 tons of forging pressure, is applied to the pipe to make the weld.

Goal of the project is to perfect the equipment and technique to the point where two 60-ft. joints of 8-in. pipe can be welded in two minutes.

At that speed, it will be possible to join 8-in. pipe at the rate of one mile every three hours.

Stiffer Training Will Be Needed For Pipeliners

A higher level of training will be demanded of pipeline company personnel as jobs become more skilled due to automation, according to J. A. Horner, president of Shell Pipe Line Corp.

Horner stressed this point in a paper at this week's annual pipeline conference of the American Petroleum Institute, at St. Louis.

"Progress in technology has revolutionized the whole atmosphere in which we work, the functions we can perform, and the responsibilities we must, therefore, assume," asserted the pipeline company president. "We must hurry to catch up with the new instruments and techniques that have come to hand."

Automation—and related new tools—will require people of superior know-how in several important operating positions. Among them: dispatcher, station attendant, and mechanical, electrical, and communications technicians.

The dispatcher must be able to work with computers to establish inventory levels and optimum line conditions, and with techniques of precise blending and better control of volatile injection, Horner said.

He pointed out that automatic and remote station operation has created the critical job of station attendant. "He requires considerable technical aptitude and sufficient skill to perform preventive and regular operating maintenance."

"The majority of our mechanical work today requires considerable precision . . . ," Horner explained, and supervisory control employs new electronic gear, which requires the electrician to "constantly study" so that he can service it.

What's New / IN TRANSPORTATION

Transcontinental Gas Pipe Line Corp. will continue preliminary work on its proposed LPG line from Texas to the Southeast, despite plans of another company to build a line following roughly the same route.

The competing firm is Dixie Pipeline Co., formed by eight oil companies (PW—Apr.14'61,p41).

E. Clyde McGraw, president, told stockholders last week: "This competitive line will, of course, if built—pre-empt part of the product which we had planned to ship . . . and it requires us to revise our engineering approach." But he added, Transco has not "abandoned" its idea of building a line.

Another project proposed by Transco is construction of underground gas storage facilities in the Wharton field, Pa., which will cost $26-million. The company will ask the Federal Power Commission for authority to jointly develop the field with United Natural Gas Co. The project will boost its storage capacity in the Northeast by 250-million cf/d.

Hearings opened in California last week on whether to issue special safety regulations governing use of collapsible containers to haul flammable liquids (PW—Dec.2'60,p46).

The hearings, which will be held by the Public Utilities Commission, will also cover such matters as operating rights and minimum rates.

Use of such containers in the state has been slight, pending a PUC decision.

•

Cities Service Gas Co. proposes to spend $2,155,000 to build and replace sections of pipeline in Kansas, Missouri, and Oklahoma.

In Kansas and Missouri, construction would involve replacing sections of three lines with larger diameter pipe, and building an 8½-mi. loop. Cost would be $1.3-million.

In Oklahoma, the company wants to build 23 mi. of 16-in. line at a cost of $850,000 to connect Ringwood field, in Garfield County, with its 20-in. line in Noble County.

This advertisement appears as a matter of record only. No public offering is being made of this Note.

$24,000,000

Murphy Corporation

5¾% Promissory Note due September 1, 1975

(With Stock Purchase Warrants)

Arrangements have been completed, with the assistance of the undersigned, for the placement of this Promissory Note.

LEHMAN BROTHERS

April 18, 1961.

Venezuela Warned on Oil Policies

CARACAS—The Venezuelan Federation of Chambers of Commerce & Industry (Fedecamaras) last week adopted resolutions calling on the government to provide more encouraging conditions for the oil industry.

At its annual assembly, the businessmen's group made recommendations on oil price policy, tax allowances, the recently organized national oil company, and Venezuela's role in the Organization of Petroleum Exporting Countries (OPEC).

Earlier in the meeting, Fedecamaras' directors warned that the success of Venezuela's oil policy hinges on an increase in crude production costs in the Middle East.

In a 12-page analysis, more critical of Venezuelan oil policy than that presented last year, the directors declared that Venezuela's policy "depends on the extent to which the achievement of better [concession] terms, and labor pressures, modify the structure of production costs in Middle East countries and diminish the ample differential of profits."

"Of greater importance," the document continued, "is the fact that the level of social and political evolution and the constitutional framework of the Middle Eastern peoples are entirely different from conditions prevailing in Venezuela, and it would not be surprising that these circumstances would . . . unleash an open struggle for the conquest of markets.

"If this were the case, Venezuela would already have lost much of its potential . . . and in this struggle would be in an inferior position."

The Fedecamaras analysis also noted that the oil industry is thinking seriously of alternative investments in other countries because of declining oil revenues in Venezuela.

The directors said this is occurring at the same time that social and political pressures in Venezuela are "inordinately" increasing the demand for investment here.

Fedecamaras asked Venezuela to use its influence in OPEC to maintain "a climate of harmony for the private oil industry."

It was the only reference the businessman's group made in its resolutions to the Organization of Petroleum Exporting Countries, in which Venezuela has been a prime mover.

Fedecamaras also "insisted" in a resolution that the Venezuelan national company must have no special privileges from the government.

The chamber urged that the firm, Corp. Venezolana del Petroleo, act "with due prudence in expanding its activities."

(Earlier in the meeting, Fedecamaras heard Venezuela's President Betancourt say: "We have no intention of converting it [the national company] into a competitor of the oil companies to the disarticulation of their markets.")

As regards price policy, the group asked that "due importance be given to the role [prices] play in the retention and conquest of markets."

The resolution also called for "flexibility of operations" so that oil companies in Venezuela could meet world competition.

At another point, the government was asked to make an "exhaustive evaluation" of as-yet undiscovered Venezuelan oil resources.

This is necessary, the Fedecamaras resolution said, so that official policy can take into account the true volume of Venezuela's oil resources.

The chamber also called for continued efforts to modify U.S. import restrictions, which have affected the markets for Venezuelan oil, and for tax allowances for companies for reinvestment and expenditures abroad.

President Betancourt, addressing the Fedecamaras meeting, assured the group the government was studying fiscal reforms to stimulate investment in exploration.

The chamber's resolution itself urged adoption of "adequate measures to reestablish the exploratory process in new areas."

Betancourt also declared that the national company would issue exploration service contracts, "but no longer concessions, which is a word of unmistakable colonial savor."

These service contracts, he added, would be similar to those that exist in Argentina and Mexico.

Japanese Lukewarm to Soviet Offer of More Crude for Pipe

(A Report from PETROLEUM WEEK'S *Far East Bureau)*

TOKYO—A Soviet trade mission, proposing a crude oil-steel pipe swap to the Japanese, appears to be running into negative reactions among Japanese refiners, industry sources say.

Discussions among mission members, including oil experts, and independent Japanese refining companies have been held recently on a "commercial," that is nongovernmental, basis. The Russians reportedly, have not made any specific proposals as yet.

When and if a crude-for-pipe deal is worked out between the Soviets and Japanese industry, it would have to be approved by the Japanese government.

The Russians want Japanese steel for a 2,800-mi. Siberian pipeline that would carry crude to Nakhodka, a Russian port on the Sea of Japan near Vladivostok.

They have told the Japanese that construction on the line, which it is estimated would cost $120-million, would begin in 1964, with completion set four years later. Some 650,000 tons of 28-in. pipe would be needed for the project, according to Japanese sources.

Steel makers in this country have privately expressed doubts about meeting Soviet price demands. Japanese pipe generally costs more than competitive products from the western European nations.

In return for the pipe, Japan would get what it badly wants, low cost crude—lower in cost, in fact, than that which it now imports from the Soviet Union.

Soviet spokesmen here have said that the oil would be priced at $1.59 per bbl. Tanker rates from Nakhodka to Japan would lift the total laid down price to $1.91 per bbl. These prices would mean considerable savings over those now paid by Idemitsu Kosan, Japan's principal buyer of Russian crude.

But there is a hitch. Some Japanese experts think the Russian offer of crude would be far too large for Japan to absorb.

One oil expert here figured this way:

To be feasible, the Russian pipeline would have to carry about 500,000 b/d eastward. In Communist China and the Soviet satellite states of North Korea and North Vietnam, there is a market for approximately 200,000 b/d.

Thus Japan would have to absorb about 300,000 b/d of the Russian crude.

There is, however, dissenting opinion on the ability of Japan to take the Russian crude.

One Western oil man with considerable experience in the Japanese market said recently he believed this country could absorb another 300,000 b/d by 1968, when the Russian pipeline is proposed for completion.

Others in the industry believe, also, that Communist Far East countries could take more Russian oil than the estimated 200,000 b/d.

This could mean Japan's share would be less.

While industry sources predict Japanese demand will reach 1.84-million b/d by 1970, two major factors must be considered in figuring how much Russian crude Japan can use by then.

First, experts here can only count the independent refiners as potential buyers of Russian crude. Refineries that are connected with major international oil companies, as many are here, will not be in the market.

Second, the Japanese-owned Arabian Oil Co. hopes to be producing 200,000 b/d in the Middle East by 1970. This crude most likely will be marketed in Japan.

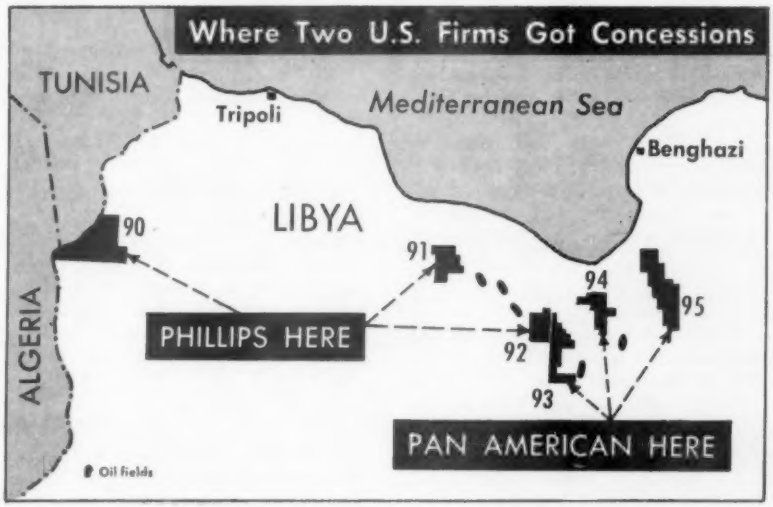
New Era Opens in Libyan Exploration

The award of six concessions last week opened Libya's doors to a newcomer and gave an older Libyan hand additional acreage in a more advantageous area (PW—Apr.21'61, p23).

Opening a new era in Libyan exploration, the Petroleum Commission, for the first time, awarded part of the acreage relinquished by other oil companies late last year under terms of Libya's oil law.

This law provides that one quarter of each concession, with a few minor exceptions, be returned to the Petroleum Commission five years from the original concession date.

When the Petroleum Commission opened the acreage for bidding in March (PW—Mar.24'61,p44), three companies filed applications, which now have been acted on.



Phillips, the newcomer, was awarded three tracts covering 3,972 sq. mi. in far western Libya and the western section of the Syrtica Basin in central Libya (map).

Of the company's concessions, Blocks 90 and 91 were parts of tracts formerly held by Oasis Oil Co. (owned jointly by Amerada Petroleum, Continental Oil, and Ohio Oil). Phillips Block 92 was once part of Mobil's concession 11; on the part of the block that it retained, Mobil has completed three producing wells, testing as high as 1,500 b/d.

Phillips dropped its application for another block, just south of Concession 90.

Pan American, an Indiana Standard affiliate which was already operating in Libya, was awarded three tracts totalling 3,227 sq. mi. in the central Libya area where the major discoveries have been made.

Block 93 of the company's new concessions includes a part of a tract once held jointly by Esso Sirte, Libyan-American Oil Co. (a Texas Gulf Producing Co. affiliate), and W. R. Grace & Co., and also a part of one held formerly by American Overseas, a Caltex affiliate.

Block 94 was once a Mobil preserve. And Block 95 is composed of parcels once held separately by Esso Libya and Mobil.

The new Pan Am concessions have an additional advantage. They are relatively close to the Mediterranean Coast.

The three concessions Pan Am has held since 1958 are far to the south, in the Libyan desert. The distance and the desert make for imposing logistical problems in exploration. They would create an equally imposing and expensive pipeline construction problem if oil is found.

While the two U.S. firms made out all right, the Italian state-owned ENI group, another bidder, was not so lucky. It was ruled ineligible to bid by the Petroleum Commission.

The reason for ENI's ineligibility was not made public. ENI's affiliate Cori, already holds one concession, for which it gave Libya benefits in 1959 far exceeding the minimums set by the oil law.

In the meantime, Gulf Oil has announced a 1,100 b/d discovery in its Block 66 in western Libya.

The new well, designated 0-1-66, produced 37.6-gravity oil at that rate through ¾-in choke on a recent drillstem test. The producing section was at approximately 4,700 ft.

The find was the sixth for Gulf in the concession, where most of the company's drilling efforts have been concentrated.

The biggest discovery on the block, the Hamada find, produced 1,200 b/d on test. Other wells have been tested for from 400 to 700 b/d.

Despite the oil finds in the area, Gulf has not yet announced plans to produce oil in the area on a commercial basis.

The concession, which covers some 11,200 sq. mi., lies about 300 mi. south of the Mediterranean coast.

What's New / AROUND THE WORLD

Sun Changes Mind About Libya Search

LIBYA—Sun Oil Co. has "changed its mind" and won't seek Libyan exploration rights.

That information was contained in a statement made last week by a Sun senior vice-president, John G. Pew. No reason for the company's action was given.

•

WEST GERMANY—The Italian state-owned ENI group is expanding its marketing activities in West Germany.

An affiliate, Agip, AG, plans to build a series of new filling stations in southern Germany in the near future. It now operates seven stations in Nuernberg and one in Munich.

•

SPAIN—A private Spanish oil company has spudded its first wildcat in mainland Spain. The firm, Cipsa, is drilling the test in the Gerona area in the northeastern corner of the country.

•

PERU—Mobil, having abandoned its No. 1 Zorillos test, is preparing to spud another wildcat 6 mi. away. The company stopped operations on the Zorillos wildcat after drilling to 8,883 ft. without results. The test was spudded last Jan. 1.

•

UNITED KINGDOM—The French major, Cie. Francaise des Petroles, will expand in England by building an import terminal on the Manchester Ship Canal at a cost of $700,000. CFP entered the market here four months ago, selling gasoline at Manchester and London.

•

NEUTRAL ZONE—The Japanese-owned Arabian Oil Co. has completed a 5,460 b/d producer in its offshore field. The well, thirteenth completed by the company, is in the Khafji Field in the Persian Gulf. Arabian is currently producing about 75,000 b/d from the concession it holds from Kuwait and Saudi Arabia.

•

AUSTRALIA—North Star Oil Co., Dallas, has acquired Triton of Australia, Ltd., holder of exploration rights to 52-million acres in Queensland. Terms of the acquisition, which involved cash and stock, were not revealed. Geological studies are expected to start in the near future.

•

SPANISH SAHARA—A group composed of three U.S. firms and a Spanish company expects to spud its first wildcat here by year's end, Sun Oil Co., a partner in the venture has announced. Sun's partners are Champlin Oil & Refining, the operator, and Pure Oil, and the Spanish firm Iberica.

•

MIDDLE EAST—A charter for the $100-million Arab Tanker Company was approved last week by the Arab League Economic Council. The council also invited the league's member states to sign the charter. The company's headquarters will be set up in Kuwait.

•

AUSTRALIA—Dehli-Taylor, of Dallas, will begin drilling of its third Australian test during the first week in May.

The test, expected to be carried to 6,000 ft., will be drilled on Mornington Island, in the Gulf of Carpentaria off Australia's north coast. An Australian firm, Santos Ltd., is a partner in the venture.

•

UNITED KINGDOM—Esso was awarded exploration licenses covering 1¼-million acres in southern England by the Ministry of Power last week.

The company believes the area to be an extension of the Paris Basin of Northern France, where oil has been found in commercial quantities. The company intends to begin seismic work within two months.

•

PERU—Construction of the 7,000 b/d refinery at Conchan in which California Standard has an interest began this month.

Peruvian capital will finance 65% of the $7.4-million project, with U.S. capital providing the remaining 65%. Capacity is expandable to 12,000 b/d.

•

VENEZUELA—The Superior Oil group almost tripled its Venezuelan production in the first quarter of 1961 over the same period last year. The group upped production from an average 28,000 b/d for January through March, 1960, to 88,700 b/d for the first three months of 1961. The official government figures in 000 b/d:

Company*	Mar. '61	3-Mos. Avg. '61	3-Mos. Avg. '60
Creole	1,174.3	1,214.5	1,098.3
Shell	719.3	742.0	762.8
Mene Grande	402.8	413.1	435.5
Mobil	135.8	125.4	118.8
Sun	89.6	89.3	68.7
Superior	88.7	80.7	28.2
Richmond	83.1	80.3	53.4
Texaco	58.3	57.4	57.4
Sinclair	54.8	61.3	47.8
Phillips	46.2	46.6	57.7
San Jacinto	31.4	30.7	44.0
Atlantic	27.0	27.5	25.1
Signal	22.2	22.7	29.8
Mercedes	17.0	16.8	17.4
Caracas	8.6	8.5	7.6
Coro	6.8	7.1	8.1
Talon	1.2	1.2	1.1
Continental	1.3	0.9	—
Totals	**2,968.4**	**3,026.0**	**2,861.7**

**For joint ventures, total group production is listed under operator's name.*

Sinclair Seeks European Marketing

BELGIUM—Sinclair is taking the first steps towards refining and marketing operations in Europe.

The company has set up a wholly-owned subsidiary at Brussels with an initial capitalization of $250,000. The shares are owned by several Sinclair affiliates.

The new company gave as its object the "manufacture, acquisition, sale, cession, and distribution of petroleum products."

Sinclair is currently negotiating for a site for berthing accommodations in Zeebrugge harbor.

The negotiations are said to be in "an advanced stage."

PETROLEUM WEEK'S Fingertip Figures

April demand seems to be pulling a switch. Gasoline demand, which had been expected to hit a record for the month, has been disappointing. Distillates—normally sluggish at this time of year—are relatively strong.

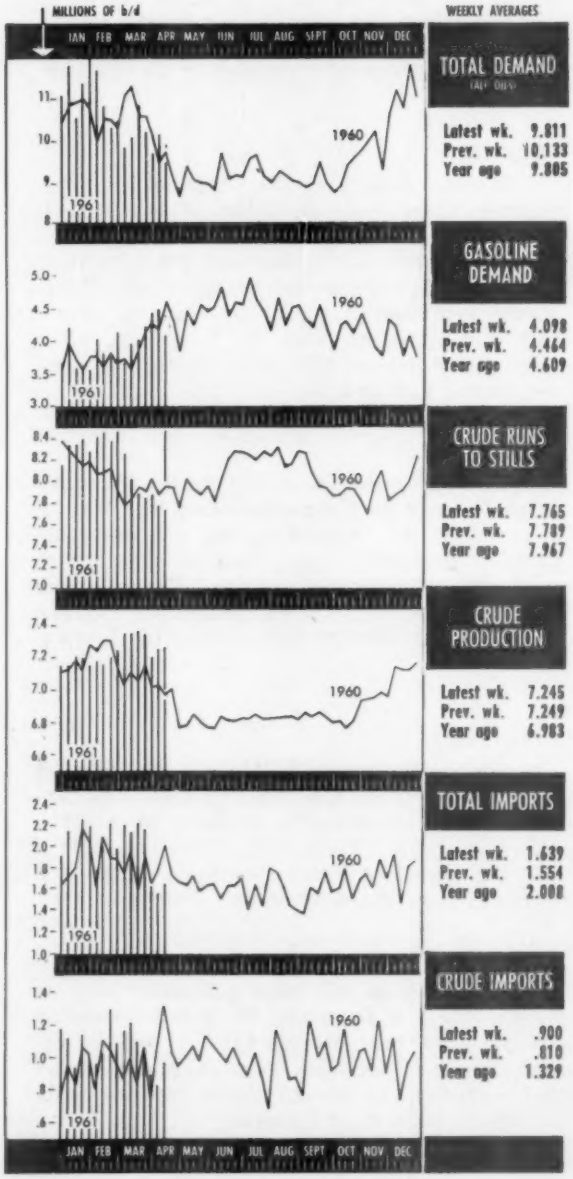
Distillates demand so far in April is running 93,000 b/d above a year earlier. The relatively cooler weather has helped trim 9.8-million bbl. from distillates inventories.

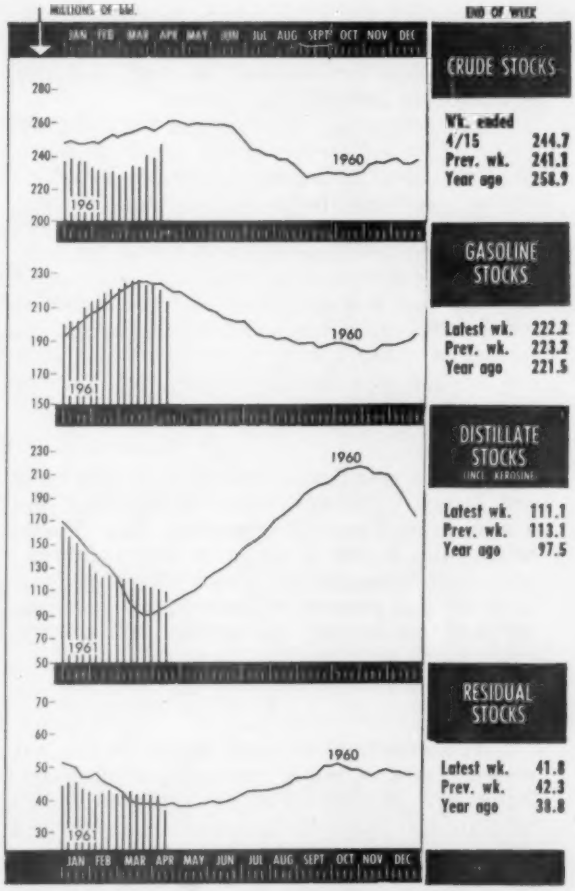
But gasoline is dragging its heels. For the past four weeks, demand for motor fuel has averaged 4,256,000 b/d, or 61,000 b/d under the comparable period of 1960. Largely as a result of the weaker gasoline showing, demand for all products, including exports, has slipped 73,000 b/d under a year ago.

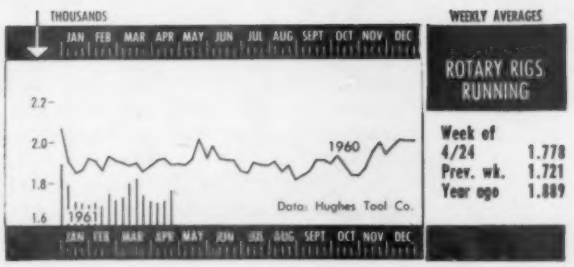
Gasoline stocks last week fell 1-million bbl. to 222.2-million bbl., or 600,000 bbl. higher than last year.

Refinery runs are still on the downtrend. An additional 24,000 b/d were trimmed off crude throughput last week. At 7,765,000 b/d, runs are a hefty 202,000 b/d under last year.

All figures below are for the week ended Apr. 21 unless otherwise noted.







Company Developments

Engineering Supply Co. last week introduced high-speed electronic data processing to the field of industrial distribution in the Southwest. The Texas Instruments Inc. subsidiary will use a new IBM 305 Ramac to process customer orders, for purchasing and inventory control, and for general accounting.

•

Tracerlab has been awarded a $46,000 contract by the Atomic Energy Commission, Office of Isotope Development, to study methods of producing "scintillating resins."

The concept of "scintillating resins" grew out of the need to extend the limits of sensitivity achieved by nuclear radiation detection devices used in government research projects. Development of the material will make it possible to produce a sensitive, selective, and inexpensive apparatus for measuring very small quantities of radioisotopes used in studies of water supplies, underground leak detection, detection of effluent from waste disposal plants, and tracing of industrial waste products, the company says.

•

The 22-year partnership of E. Curtis Long and Joseph P. Ryan is being incorporated into a new firm—Repco Engineering, Inc., Montebello, Calif. Repco is active in design, fabrication, and construction in the fields of heat transfer and process equipment, pressure piping and mechanical specialities, and general engineering construction.

•

Minneapolis-Honeywell Regulator Co. has revised its flow meter engineering handbook. The handbook, first released in 1936, and revised in 1946, has basic flow calculations rearranged for easy reference, and includes primary measuring devices other than orifice plates.

•

Mergers

Air Products, Inc., Allentown, Pa., and Southern Oxygen Co., Bladensburg, Md., are merging. Stockholder approval of the stock-exchange agreement will be requested shortly.

Air Products, long in the cyrogenic industry, is now completing a $35-million plant expansion to materially increase its output of industrial gases. Southern Oxygen is a producer and marketer of oxygen, nitrogen, and other industrial and medical gases in the Southwest.

•

United Refining Co., Warren, Pa., will merge with its wholly owned marketing subsidiary, Emblem Oil Co., in an effort to streamline operations and intensify marketing efforts. Stockholders approved the merger at the company's recent annual meeting.

•

Moving

Iverson Supply Co. is shifting its headquarters from Tulsa to Dallas around June 1. The company is making the move to put it in a key oil center with adequate transportation facilities and substantial independent oil operator representation. A. L. Wallace, executive vice-president, and H. E. Schad, office manager, will head the staff, which will number between 25 and 30.

•

Hills-McCanna Co. moves its headquarters from Chicago to Carpentersville, Ill., May 1. It's part of an "expansion and centralization program designed to provide a growing line of products and improved service." The company manufactures all valves, diaphram valves, proportioning pumps, and automatic lubricators.

•

Overseas

Minnesota Mining & Mfg. Co. plans to set up a wholly owned subsidiary in Vienna to handle sales of all company products in Austria. Minnesota "3M" Technische Vertriebs GmbH, will be headed by Ernst Bernhard, formerly a regional sales manager in the European area.

•

Construction will soon get under way on Grove Valve & Regulator Co.'s new manufacturing plant near Mexico City. It will be operated by Grove de Mexico, S. A., and will have the capacity to manufacture pipeline gate valves up to 36 in. in diameter.

LOUIS F. DAVIS will succeed **Edgar Kraus** as general manager of Atlantic Refining Co.'s domestic producing department, with offices in Dallas. Kraus will retire next month. Davis has been a regional division manager for the department since 1958. At the same time, Atlantic announced a reorganization of that department. Its five regions and one Canadian district will be replaced by two regions and three unattached districts. **Robert T. Cox** will be manager of the western region, at Midland, Tex., and **F. W. Turner** will be head of the eastern region, at Houston. Atlantic's Canadian operations will continue as a district, but eventually will be raised to regional status. The other two districts under the new setup are Rocky Mountain and Oklahoma-Kansas; the company expects eventually to incorporate these into a fourth region.

L. F. Davis

I. H. Ricketts

I. H. RICKETTS has been named general superintendent of Calnev Pipe Line Co., which will operate a refined products pipeline, now under construction, that will go from the Los Angeles basin to Las Vegas, Nev. Ricketts was formerly a project engineer for Williams Bros. Co., Tulsa. He has also been associated with Continental Pipe Line Co., Platte Pipe Line Co., and Cities Service Oil Co. Ricketts will move from Tulsa to San Bernardino, Calif.

DON W. CONAWAY will manage oil and gas sales and purchases for British-American Oil Producing Co., with headquarters in Dallas. The former manager of B-A's gas and gasoline section will negotiate sales contracts for natural gas and liquefiable petroleum gases, approve the company's investments in processing facilities, and supervise the purchase of all oil and condensate by the company's subsidiary, Toronto Pipe Line Co. He will also market all oil and condensate purchased by the company and its subsidiaries. Conaway's new position includes duties held by **Myron Messner**, who retired Apr. 1 as manager of crude sales and purchases.

JOHN S. LEONARD has been appointed manager of asphalt sales for the domestic sales department of Texaco Inc., with offices in Houston. He succeeds **Theodore R. Ellis**, who has retired. Leonard was formerly assistant manager in charge of wholesale sales for Texaco's Dallas division.

R. Waer

P. McHenry

ROY WAER and **PAUL McHENRY** have been elected vice-presidents of Macmillan Petroleum Corp., Los Angeles. Waer, who has been manager of the company's California division for the past three years, will continue to be in charge of its California operations. McHenry, manager of the Arkansas division, will be given more autonomy and responsibility in his new position.

WILLIAM E. TOOMBS moves up to vice-president of the newly organized international division of Technical Drilling Service, Inc., with headquarters in Oklahoma City. The company will offer the same air and gas drilling services abroad that are available in the United States. Toombs was formerly division engineer for the company.

WARREN A. BEMAN has been appointed vice-president in charge of chemical activities of Union Texas Natural Gas Co., Houston. He was formerly manager of Mobil Chemical Co.'s new projects department.

DON D. MATSON, formerly seismologist for Midwest Oil Corp. at Denver, will move to Midland, Tex., as the company's West Texas manager of exploration. At the same time, **J. R. Rowan** was appointed head of Midwest's land department at Midland. **John A. Croom** has been appointed head of the land department at the Ft. Worth office, succeeding **Bert M. Nunnallee**, who has resigned to enter private law practice. **W. E. Golden**, landman, has been transferred from Calgary, Alta., to a newly established Midwest office in Ft. Smith, Ark.

P. L. RICHARDS is manager of a new chemical division in the marketing coordination department of Standard Oil Co. (N.J.), New York. The division will handle Jersey's increasing activities in the international chemical field. Richards was most recently assistant general manager of the cargo sales department of Esso Export Corp., Jersey's international marketing affiliate. Richards, who has been with the Jersey organization since 1937, joined Enjay Chemical Co. in 1950, where he served successively as assistant sales manager and sales manager of the alcohols and chemicals division, and then as assistant sales manager of the company. He moved to Esso Export in 1959 as manager of the chemical products sales division, and later became assistant general manager of cargo sales.

P. L. Richards

W. G. Denning

W. G. DENNING has been named petroleum products advisor to the general manager of Humble Oil & Refining Co.'s Baytown (Tex.) refinery. Denning has just completed a rotational assignment as acting assistant head of the refinery's technical division.

W. W. ADAMS has been named executive financial representative for Gulf Oil Corp.'s domestic marketing department, with headquarters in Houston. Adams, who joined Gulf in 1928 at Maracaibo, Venezuela, was most recently vice-president of Mene Grande Oil Co., Gulf's Venezuelan subsidiary, in Caracas.

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ROBERT E. LEWIS has been elected president, chief executive officer, and a director of Perkin-Elmer Corp., Norwalk, Conn. He succeeds **Richard S. Perkin,** who will continue as chairman of the board. Lewis recently resigned as president of Sylvania Electric Products, Inc., a subsidiary of General Telephone & Electronics Corp. Perkin-Elmer is a producer of analytical instruments for chemical research and process plant control, electronic-optical systems, and electronic components.

R. E. Lewis

C. H. Rieman

C. H. RIEMAN has been elected executive vice-president of Gardner-Denver Co., Quincy, Ill., succeeding **E. V. Erickson,** who becomes senior vice-president. Rieman was formerly vice-president and general manager of the company's Denver division.

Robert H. Meystre, formerly treasurer of Gardner-Denver, is now its financial vice-president and treasurer. **Alexander G. Lindquist,** who is retiring as financial vice-president, will continue to serve as a director and member of the company's executive committee. **William H. Miller,** controller, has also been elected a vice-president. **Neil Fishback,** formerly sales manager of the company's mining equipment division, has been named general manager of Denver plant operations.

C. A. GUNN, Copperweld Steel Co., Chicago, is the new president of the Petroleum Electric Supply Assn. He succeeds **John D. Trilsch,** John D. Trilsch Co., Houston, who has been appointed board chairman of the association.

C. R. PERRY, formerly senior sales engineer for Schlumberger Well Surveying Corp.'s South Louisiana division, at New Orleans, has been named location manager for the company at Venice, La. He succeeds **T. W. Cobb,** who has moved to Houma, La., to head that location's truck services operations. **F. A. Eastman,** formerly location manager at Houma, transfers to Monroe, La., in the same capacity. He succeeds **W. H. Throop,** who will serve as Houma motor vessel location manager. **A.**

W. H. LARKIN (left) was elected president of the Petroleum Equipment Suppliers Assn., at its annual meeting this month, and **W. J. McWILLIAMS** (right) was elected vice-president. Larkin is president and general manager of the Larkin Packer Division of Koehring Co., Waxahachie, Tex., and McWilliams is president of Republic Supply Co., Oklahoma City. Newly elected PESA directors-at-large are: **Frederick F. Murray,** Oil Well Supply Division, U.S. Steel Corp., Dallas; **Ted Sutter,** Baker Oil Tools, Inc., Los Angeles; **F. M. Mayer,** Continental-Emsco Co., Dallas; **M. B. Jones,** S. M. Jones Co., division of Buffalo-Eclipse Corp., Toledo, Ohio; **D. D. Bovaird,** Bovaird Supply Co., Tulsa; **M. E. Montrose,** Hughes Tool Co., Houston; **Rainey Elliott,** Jones & Laughlin Supply Division, Tulsa; **Grover Kilgore,** Halliburton Co., Duncan, Okla.; **Wallace D. Wilson,** Wilson Supply Co., Houston; and **Elliott A. Johnson,** Schlumberger Well Surveying Corp., Houston. **E. S. Dulin,** Byron Jackson Tools, Inc., and **J. A. Crawford,** Youngstown Steel Products Co., were elected directors emeritus.

O. Phares, formerly manager of the Houma motor vessel location, moves to North Dakota as Williston location manager.

LEONARD J. DANIELS, JR., has been promoted to head of catalyst sales for Universal Oil Products Co., Des Plaines, Ill., in an expansion of its chemical products activities. **Alfred E. Hoffman** has been named assistant manager of chemical product sales; **William K. Hunter** is UOP's new manager of chemical product development; and **Robert P. Zimmerman** has been named research coordinator, chemical products research. Daniels, who joined UOP in 1951, has been a sales engineer in the catalyst sales department since 1960. Hoffman has been a chemical products sales engineer for UOP since 1950, and before that was a UOP analytical and research chemist. Hunter joined the company in 1947, and became manager of catalyst sales in 1959. Zimmerman, who has been a UOP chemist since 1941, was most recently associate research coordinator in the chemical products research department.

L. J. Daniels, Jr.

C. L. Foss

CHARLES L. FOSS has been appointed assistant to the president of Security Engineering Division, one of the Dresser Industries, in Dallas. His responsibilities will include administrative duties as well as special assignments. Foss formerly held a similar position with Dresser Mfg. Co., Bradford, Pa., another of the Dresser Industries. Foss joined Dresser Mfg. Co. in 1952 as staff analyst, and became manager of the profit planning division in 1954, and assistant to the president in 1959.

WARREN W. JOHNSTON has been appointed vice-president, operations, for Panellit Service Corp., Skokie, Ill., subsidiary of Information Systems, Inc. PSC provides services in systems design and instrumentation engineering, installation and maintenance. Johnston will be responsible for integrating these functions into long-range corporate plans for expanding the parent company's products and services. Johnston joined PSC in 1956 as manager of its systems division.

JOHNSTON TESTERS, INC., has appointed six new salesmen to handle its sonic pump line in Texas. The new sales and service engineers and their locations are: **Tom Cunningham,** Abilene; **Bob Lee,** Corpus Christi; **Freed Little,** Houston; **Ralph Krottinger,** Odessa; **Bill Pyle,** Pampa; and **Horace Darnell,** Wichita Falls.

W. J. McBrian

L. L. Morgan

LEE L. MORGAN succeeds **Henry H. Howard** as vice-president in charge of Caterpillar Tractor Co.'s engine division, and **W. J. McBRIAN** succeeds **Gail E. Spain** as vice-president with administrative responsibility for foreign marketing. Howard and Spain will retire on June 1. Morgan, who was most recently manager of sales development for Caterpillar, will also assume administrative responsibility for the company's defense products department. **E. C. Chapman,** formerly assistant sales development manager, succeeds Morgan as manager. In his new position, McBrian will also serve as president of the subsidiary companies, Caterpillar Americas and Caterpillar of Delaware. He has been chairman and managing director of Caterpillar Tractor Co., Ltd., Great Britain, since 1956.

JAMES B. CARSE has joined Clayton Mark & Co., Evanston, Ill., as general sales manager. He was formerly director of market development for Rust-Oleum Corp., Evanston. Clayton Mark manufactures water well supplies, water systems, industrial forged steel products, electrical steel conduit, and steel tubing.

SHERROD D. DUNN and **SHERWIN R. PAPILLON** move up to field salesmen for the National Supply Division, Armco Steel Corp. They were formerly store employees. Dunn will move from Abilene, Tex., to Snyder, Tex., and Papillon will continue to be located at Jennings, La.

JAMES McCUMBY, senior vice-president of the Republic National Bank of Dallas, has also been elected chairman of its executive committee. Five newly elected directors of the bank are: **Jerome K. Crossman,** investments; **David L. Florence,** vice-president of Mayflo Oil Co.; **Charles Meyer,** vice-president, Sears, Roebuck & Co.; **Lester T. Potter,** president, Lone Star Gas Co. and Lone Star Producing Co.; and **Charles A. Sammons,** chairman of Reserve Life Insurance Co. Four men elected to the newly created position of associate director are: **Hamlett Harrison,** vice-president, Trinity Universal Insurance Co.; **J. C. Karcher,** president, Concho Petroleum Co.; **B. F. McLain,** president, Hart Furniture Co.; and **Julius H. Pearlstone,** president, Pearlstone Mill & Elevator Co.

EDWIN C. YOUNG has been appointed product sales manager for mass flowmeters and Uniflux heating equipment manufactured by Black, Sivalls & Bryson, Inc., Kansas City, Mo. Young joined BS&B in 1953 as a senior engineer, and later became chief development engineer. He has been closely associated with the development of the flowmeter and Uniflux product lines.

WAYNE F. POWERS, D. E. WILLIAMSON, and **K. L. BOOTH** have been promoted to district managers for Welex, division of Halliburton Co. Powers, formerly sales engineer at the division's Houston headquarters, will be in charge of the Pasadena (Tex.) district. Williamson was promoted from assistant district manager to district manager at Pauls Valley, Okla. **K. L. Booth,** formerly sales engineer at Pawhuska, Okla., becomes district manager at Stillwater, Okla. **C. E. Mullins,** district manager at Beaumont, Tex., transfers to Shawnee, Okla., in the same capacity, and **R. K. Riggle** has been named sales engineer at Beaumont.

ORVAL W. RIGGS is the new manager of instrument and control product sales for Republic Flow Meters Co., Chicago, subsidiary of Rockwell Mfg. Co., and will also be responsible for product sales for Republic Flow Meters Canada, Ltd. Riggs was formerly headquarters sales administrative manager for the company. In his new position, he will head a new marketing department responsible for expanded sales activities in the components field.

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Exploration personnel and oil operators

THE STRUCTURAL MAP OF THE MIDCONTINENT

by Dr. R. R. Wheeler, Meadows Bldg., Dallas 6, Texas
Brochure on request

POSITION WANTED

Petroleum Geologist, 6 years experience in surface and subsurface exploration (Europe, Near East and Africa), fluent English, French and German, looks for a position as field geologist, preferably overseas. Free May 1961. Write to PW-6396, Petroleum Week, Classified Adv. Div., P. O. Box 12, New York 36, N.Y.

Kennedy has spoken on taxes, but . . .

Congress Will Have the Final Word

PERHAPS THE MOST SIGNIFICANT DEDUCTION to be made from the President's tax message to Congress last week was that he didn't attack the percentage depletion provision as a tax "loophole."

But lest the petroleum industry be lulled into the belief that percentage depletion won't come up for discussion this year, it must be remembered that Congress—not the Chief Executive—writes the tax laws.

Taxes on business in general most likely will be the focal point of the discussion by the lawmakers. The tax concessions that President Kennedy proposed for business to provide an incentive for modernization and expansion won't have easy sledding in the Democratic-controlled Congress when the formal hearings on the recommendations start next week before the House Ways & Means Committee.

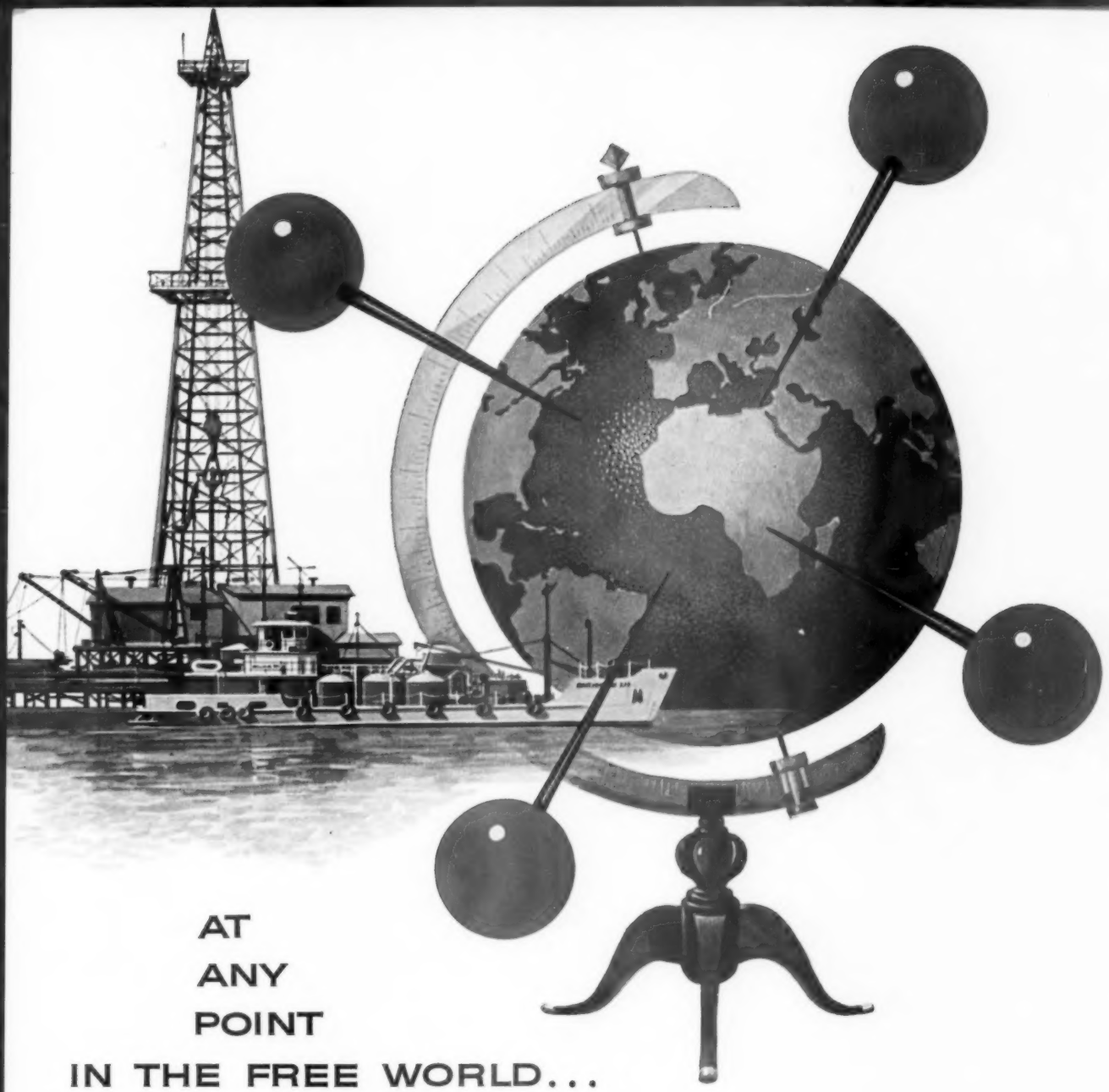
In fact, business will become a whipping boy, since the President recommended that it receive some tax concessions while he did not propose tax reductions to the public. Once the letters of protest start arriving from back home, the congressmen will start to zero in on business taxes—with percentage depletion a likely target.

Temporary Tax: Four if by Land, Two if by Air

THE PRESIDENT ASKED CONGRESS to extend the 2¢-a-gal. tax on aviation gasoline to jet engine fuel, now exempt. Starting in July, 1962, Kennedy proposed that the aviation fuels tax be increased by ½¢ a gal. each fiscal year "until the portion of the cost of the airways properly allocable to civil aviation is substantially recovered by this tax."

No one was really surprised that the President recommended the inclusion of jet fuel under the avgas tax. But what is surprising is that the subsequent increases proposed in the aviation fuels tax were sugar-coated under the guise of a temporary thing until costs are recovered.

The first federal tax on motor fuel was just a temporary one. But it has been with us since 1932, and was later legalized as a permanent and more costly thing. No one expects, either, that the temporary one-cent part of the federal gasoline tax will be allowed to die come next June 30—nor, for that matter, in 1972, when the massive federal interstate highway system is supposed to be finished and paid for.



AT ANY POINT IN THE FREE WORLD...

As offshore drilling expanded from the coasts of the United States to the waters of the free world, Halliburton expanded its operations to provide its services wherever they were needed.

Halliburton has left nothing undone to provide these offshore rigs in the far-flung waters of the world with the same excellence of products and services oil men have relied on for over 35 years.

As new pins are added to the offshore map of the Free World, they will also be pointing to new locations for Halliburton service.

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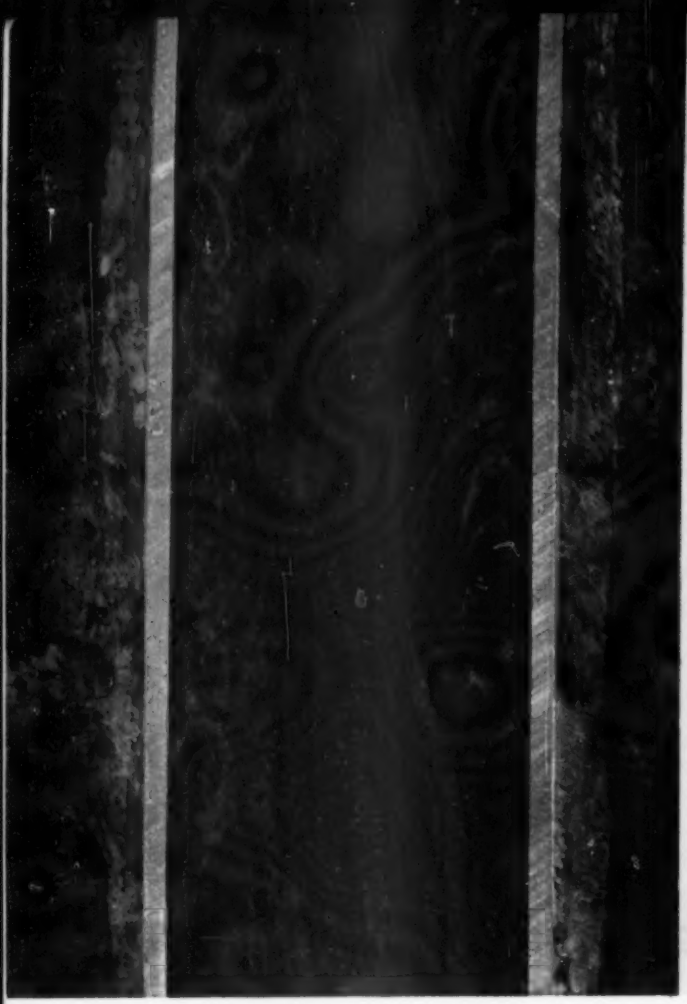

LOOK AT THE TURBULENCE in casing or tubing during a well stimulation treatment. Until recently, much of the available pumping horsepower was spent just to overcome this turbulence.

TURBULENCE IS SUPPRESSED when Slick Water or Slick Oil is added to the treating fluid. Injection rates may be more than doubled or required horsepower may be cut by as much as 70 per cent.

how Dowell's new friction-reducing agents help increase profits from fracturing and acidizing

These cross-section illustrations, as visualized by an engineer, show fluid flow down casing or tubing during fracturing or acidizing. They show how extreme turbulence wastes pump horsepower; much of the available horsepower must be used to fight this turbulence.

Slick Water* and Slick Oil* – the Dowell-developed friction-reducing agents for water, acid and oil – have made it possible to more than double the injection rate with the same horsepower. In other cases, a given injection rate has been achieved with only one pump instead of three. In still other cases, these agents have saved the cost of pulling tubing. High-injection-rate treatments have been performed down strings of 2⅞-inch casing in multiple tubingless completions. Slick Water and Slick Oil have made large fracturing treatments economical for some marginal wells by permitting the use of lower-cost fluids. They have helped many operators get exceptional production increases per dollar invested.

Ask your Dowell representative how these new friction-reducing agents can help you increase profits from well stimulation. Dowell services and products are offered from more than 150 offices and stations in the United States, Canada, Venezuela, Argentina, Germany, France and the Sahara area. Dowell, Tulsa 1, Oklahoma.

*DOWELL TRADEMARK

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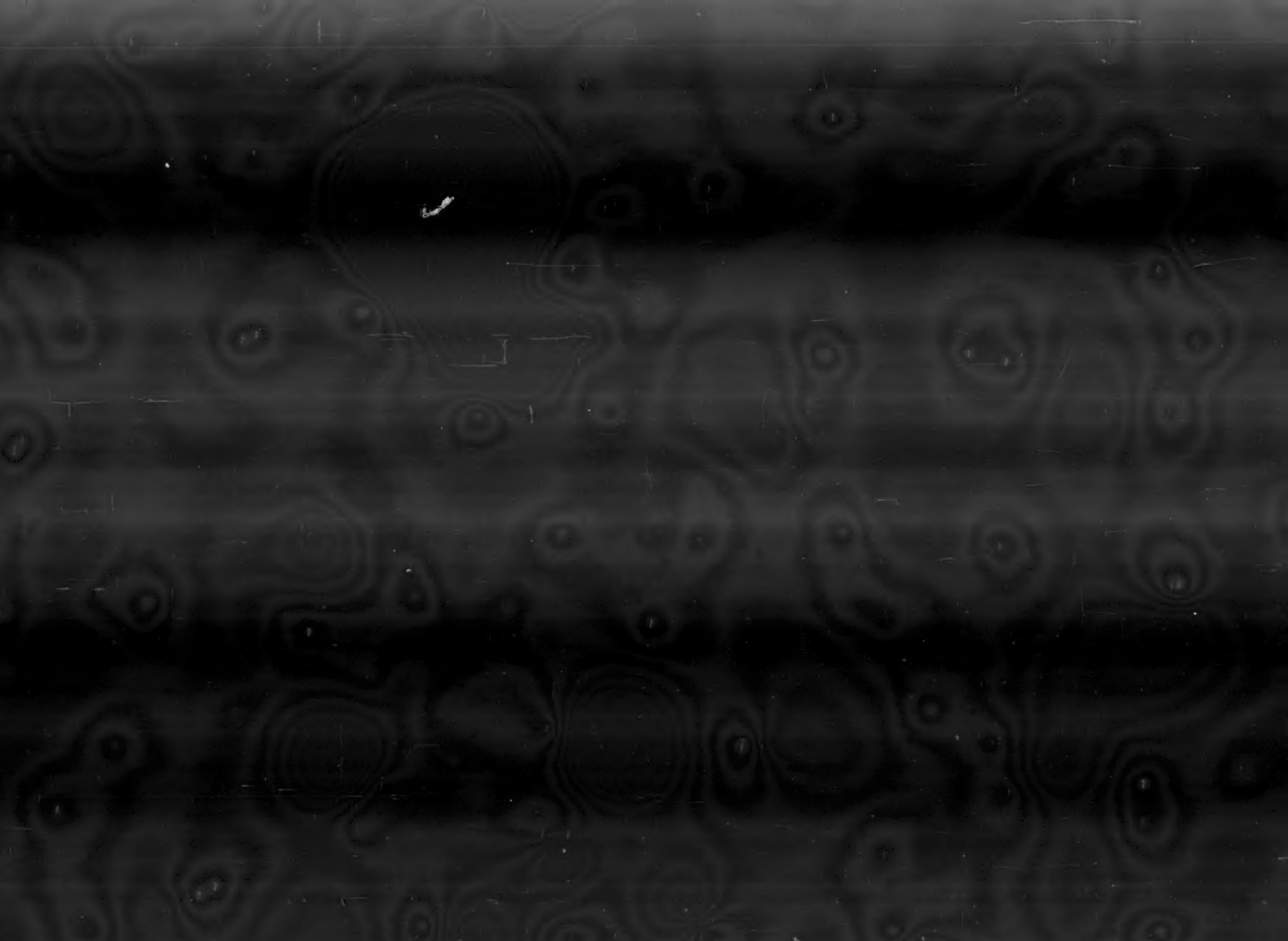

18

MAY
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1961

PETROLEUM WEEK

A McGRAW-HILL PUBLICATION

REFINING

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Price 50 Cents

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PUSH BUTTON WATERFLOOD

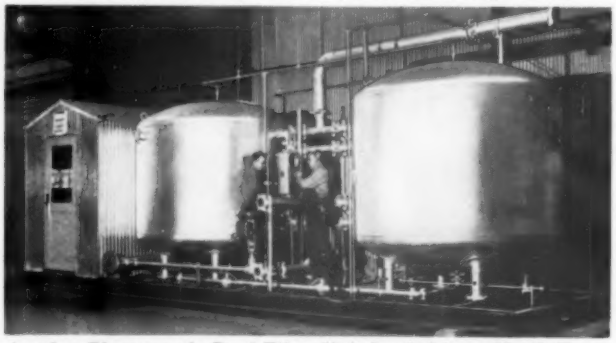
On an Illinois waterflood, this Phantomatic Filter Unit includes weatherproofed control box, three 7' x 5' graded bed filters, pumps, hydromotor operators, valves, and piping. Controller operates from pressure switches on filters and storage tanks.

Packaged . . . skid-mounted . . . automatic . . . controls fully weatherproofed . . . BS&B PHANTOMATIC Water Filter Units are engineered to meet the customer's specific requirements.

The backwash controllers, a unique and exclusive development by BS&B, provide complete automatic control of backwash on either time cycle or present filter bed differential pressure basis.

Whatever your requirements for *clear, clean water* in waterflooding operations, BS&B has the full line . . . from single filter to complete open or closed water treating systems. You can rely on equipment built by and backed by BS&B.

For your copy of BS&B's new AQUA-KLEENER brochure, write Black, Sivalls and Bryson, 7500 E. 12th Street, Kansas City 26, Missouri. Dept. 1-EU5.



Another Phantomatic Dual Filter Unit headed for a North Texas Waterflood receiving a checkout at the Oklahoma City plant.

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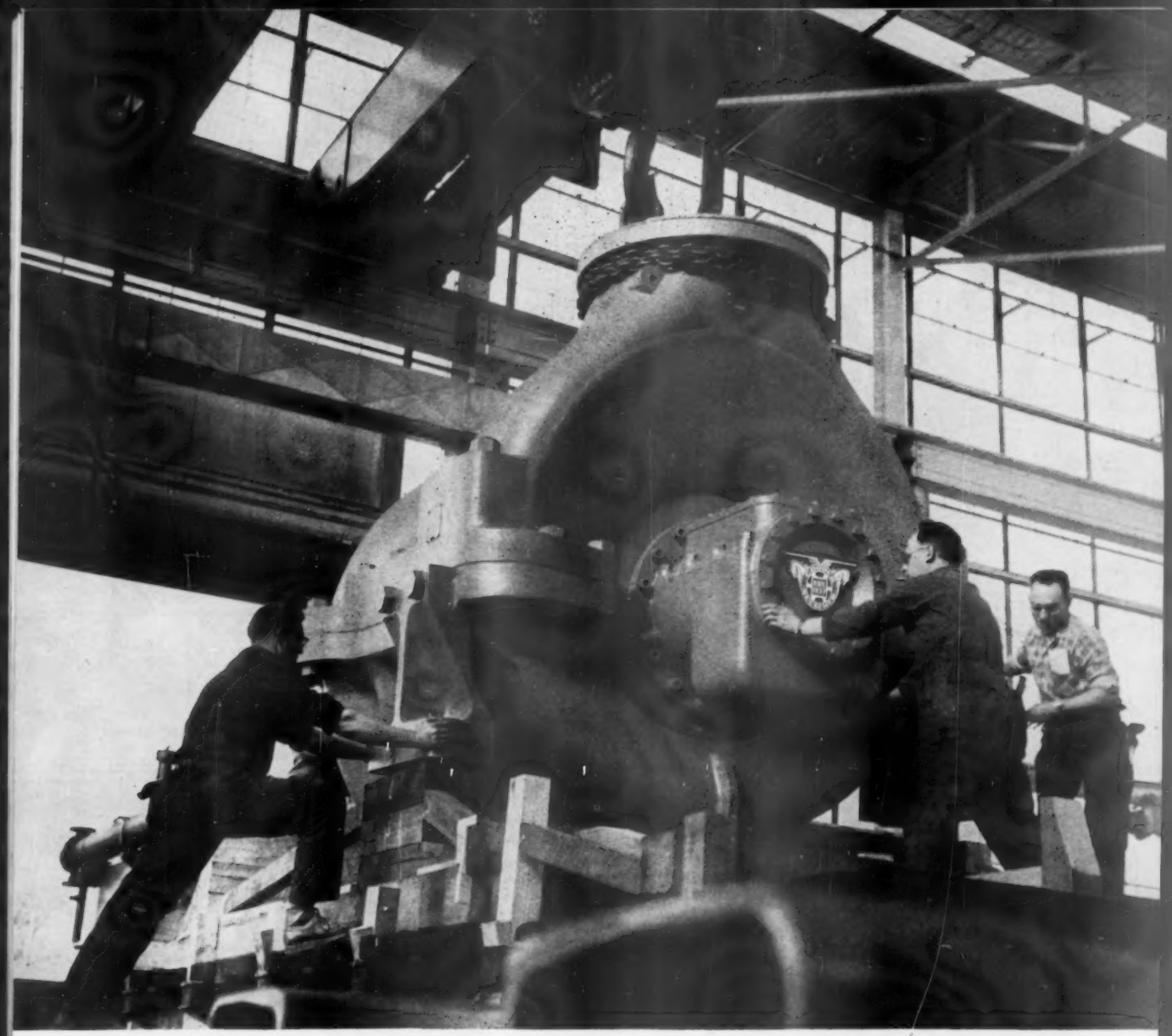

Another Cooper-Bessemer centrifugal goes to work

Here's proof of compressor economy

When your plans call for centrifugal compressors, it will pay you to be guided by the experience of others. Take a tip from the *repeat order* record of Cooper-Bessemer centrifugals as a sure sign of *cost-saving performance.*

The Cooper-Bessemer centrifugal shown here is being shipped to a chemical manufacturer for big volume compression. They *know* how reliable C-B centrifugals really are. Another unit has been operating there 'round-the-clock for two years, as part of a process, where constant availability is a *must.*

Repeat orders for Cooper-Bessemer centrifugal compressors have come time and again from many progressive companies.

Many features account for the stamina and dependability of Cooper-Bessemer centrifugal compressors—such as their rugged all-welded impellers, and unique shaft sealing. Find out how they can pay off for *you.* Call our nearest office or write . . .

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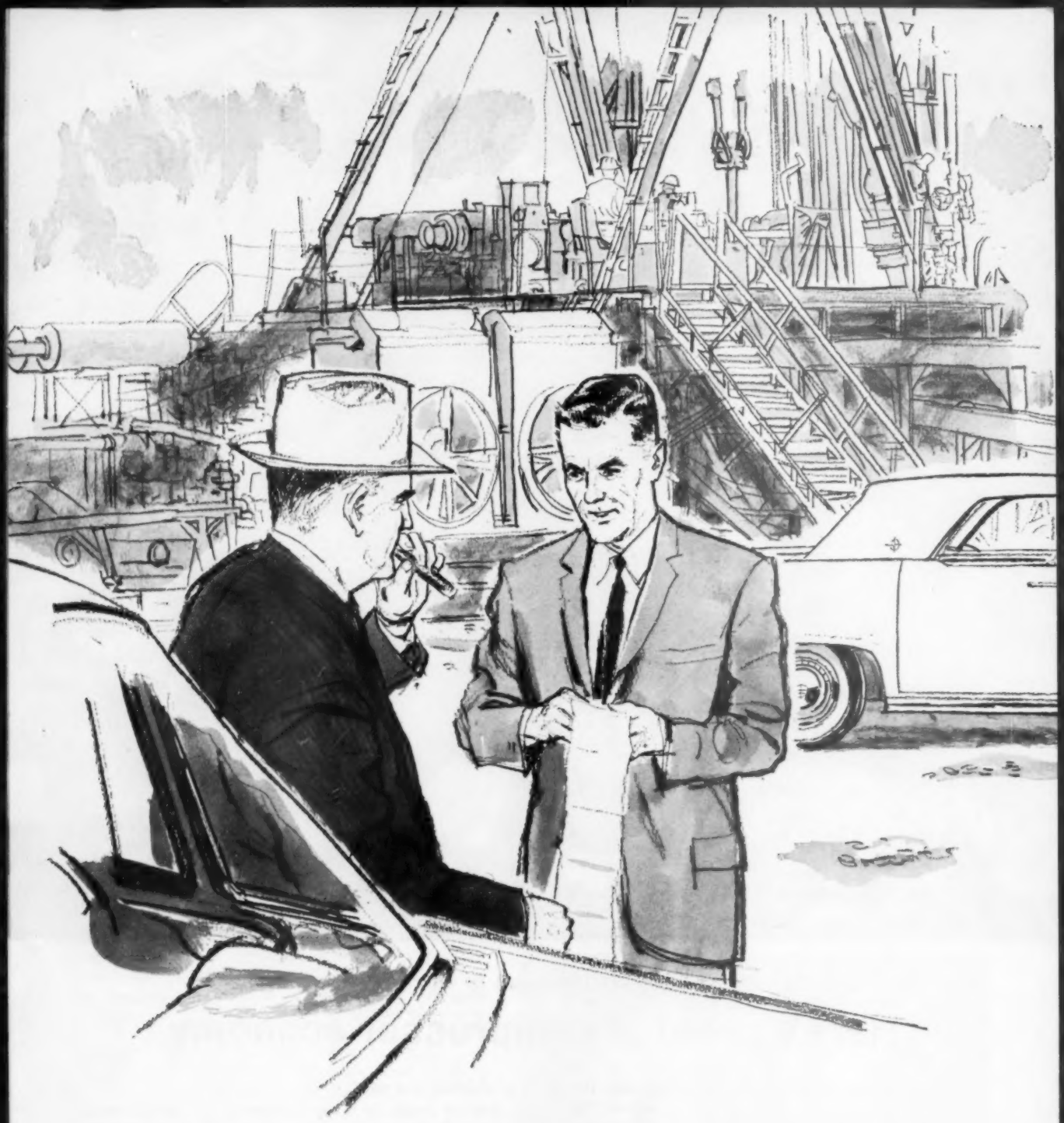

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INSIDE *Slant*

PLEASANT EXPERIENCE

Several years of pleasant experience with the oil industry's most readable magazine comes to a close with this column.

The original objectives of Petroleum Week were to report the technical and economic developments of the complex, multi-branch petroleum industry in a manner understandable to the large variety of professional personnel in the industry.

This, we of the editorial staff feel, was accomplished. At the same time, our variable-speed style of writing saved much valuable time for the readers through the presentation of the facts, and the analysis of these facts, in a clear, concise manner.

Unfortunately, the editorial excellence and acceptance by the readers did not receive the same acceptance from all of the advertisers.

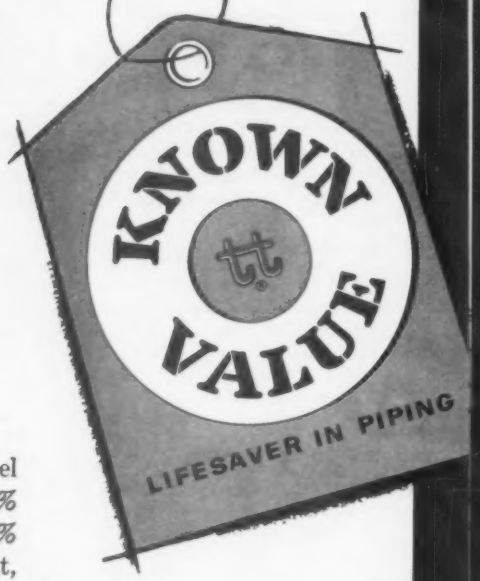
This is not to criticize them, for many saw the visability and advertising value that Petroleum Week's style offered them.

They were loyal supporters all the way through. For this, we of the editorial staff say thanks.

To all readers, so long.

LeRoy Menzing
Editor

YOU SAVE MOST WITH LIGHTWEIGHT PIPING WHEN YOU SAVE WITH TUBE-TURN® WELDING FITTINGS AND FLANGES



Process piping systems designed with new lightweight carbon steel piping have scored impressive cost reductions. Users report 30% savings in pipe costs alone. Lightweight piping weighs 20% to 50% less than standard wall carbon steel pipe . . . it's easier to handle, cut, align, weld and support . . . can be installed 25% faster. Lightweight piping also provides greater flow area, saves on pumping costs.

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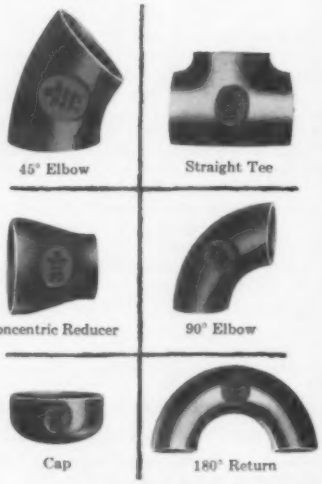
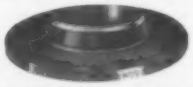
TUBE-TURN 125 lb. lightweight forged steel taper face flanges provide three times the sealing capacity of ordinary flanges . . . eliminates the hazards of breaking cast iron or semi-steel valves, fittings, and equipment. TUBE-TURN lightweight taper face flanges cost less, weigh less, and take less storage space.

If you are planning lightweight piping systems, be sure you specify TUBE-TURN lightweight piping components for maximum savings, performance and dependability. Look for the famous "tt" trademark when you buy. It's your guarantee of quality . . . the mark of *known value*. Write today for Bulletin TT942E228. TUBE TURNS, Louisville 1, Kentucky.

"TUBE-TURN" and "tt" Reg. U.S. Pat. Off.



TUBE-TURN Light Weight Fittings are available in sizes ½" through 24" —in schedule 10 and API-5L wall thicknesses.



TUBE-TURN 125 lb. Light Weight Taper Face Welding Neck Flanges are available in sizes of 2" through 24".

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Congrats and $25 to Mr. D. J. SUGGS, Republic Natural Gas Co., Tipton Bldg., Pauls Valley, Okla., for this quip.

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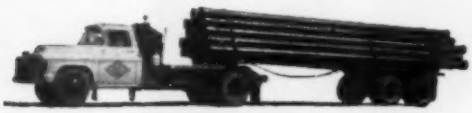

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Views That

Oil's Brainpower Shortage

Dear Sir:

Permit me to say that your editorial, "Oil Faces a Shortage of Brainpower," [PW—Apr.21'61,p94] faces up to a problem which has existed for some time. The enrollment decline in the schools of petroleum engineering has been a fact since 1956. It is extremely encouraging to learn that the problem is receiving some recognition at long last.

I would like to point out that the decline in undergraduate enrollments is bound to have an effect upon the scope of graduate programs throughout the country. It is apparent that the industry is becoming increasingly interested in petroleum engineers with advanced degrees. These men ordinarily are the leaders of their undergraduate classes. It would be extremely shortsighted not to foresee an extreme shortage of these trained engineers.

I feel that your editorial points out the major causes of the over-all problem together with some steps which would help to alleviate the situation. As you have indicated, it will be necessary for the industry to take positive steps in order to assure a continued supply of trained manpower.

C. DREW STAHL
Head, department of petroleum and natural gas
College of Mineral Industries
Pennsylvania State University

One Zero Too Many

Dear Sir:

I refer to the final paragraph of your article "Tanker Glut: New Orders Are At A Low Ebb" [PW—Apr. 14'61,p45]: "One LP-gas tanker was ordered in Japan. Conch International has on order a ship to carry 28,600 cubic meters of propane at a temperature of minus 400F."

I would like to query the quoted temperature of minus 400F, as I feel this must be incorrect for the carriage of propane.

E. A. KOISLMEYER
U.K. Representative
Willy H. Schlieker K.G.
London

• **Reader Koislmeyer is correct. The figure should have read "a temperature of minus 40F."**

Needed: Gas Incentives

"Gas is America's fastest growing

Make News

energy fuel. Can such a dynamic industry afford, for the foreseeable future, to depend for its supplies on more or less 'accident" discoveries? . . . Only remedial legislation can provide the incentives and the stability that are essential to the discovery and development of gas reserves adequate for anticipated future consumer demands."

—L. DAN JONES
Counsel
Independent Petroleum Assn. of America

No One Likes Stations

"Nobody really wants to go into a gasoline station. And there is little that we, or anybody else, can do about it. People go because they have to; just the way they go to a doctor for a checkup; if they don't, they will be sorry later . . . I think we could say that a garage performs the same function as a hospital. By the same token a service station is like an out-patient clinic. You go there under your own power, get fixed up and get out—and in fact you are not at ease until you have left the place. Truly, the modern station, with its emphasis on spotless efficiency, tries for the same sort of antiseptic look. And if it weren't for the laundry problem, all the attendants would probably be running around in white coats . . . There is nothing wrong with this as long as we realize that we are different and act accordingly."

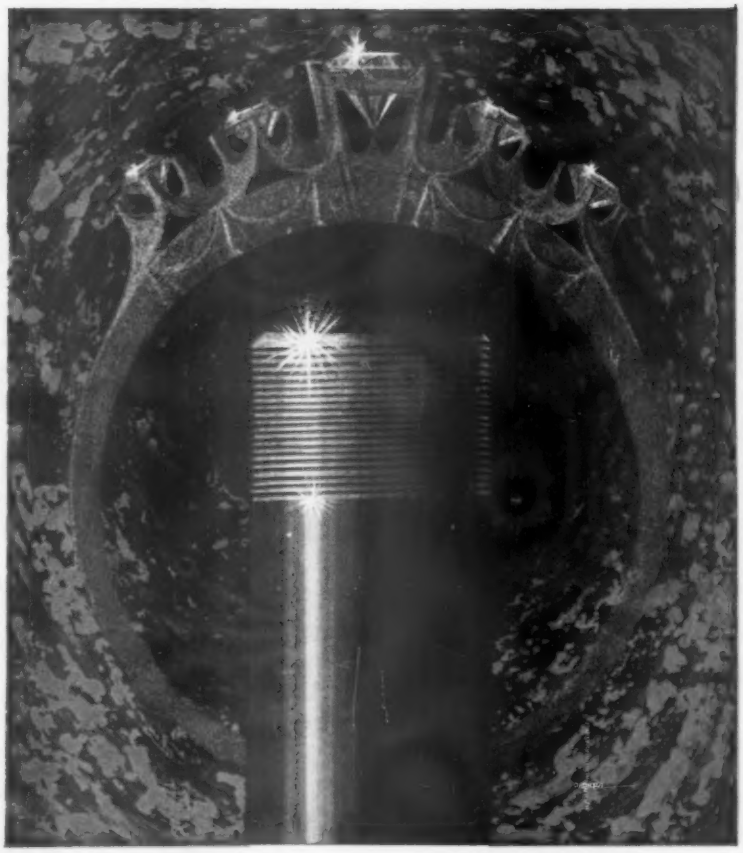
J. M. SHEA, JR.
Vice-president for marketing
American Petrofina, Inc.

Costs Up, Price Down

"The tankwagon price of gasoline in Canada today is lower than it was in 1926. Yet, over the past 35 years, millions of dollars have been spent by the industry to upgrade the quality of gasoline in this country. Two gallons of 1961 gasoline will do the work that it took three-and-a-half gallons to do in 1926—yet the tankwagon price is less today.

E. D. LOUGHNEY
President
British American Oil Co. Ltd.

PETROLEUM WEEK *will publish reader comments each week. Address letters to LeRoy Menzing, Editor,* PETROLEUM WEEK, *330 W. 42nd St., New York 36, N. Y.*



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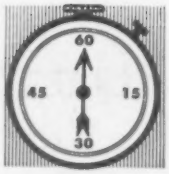
60-Second Summary



THE WEEK'S MOST IMPORTANT DEVELOPMENTS

PETROLEUM WEEK

May 5, 1961

Some changes appear certain in import regulations for the second half of 1961. Probable changes—some of which may not be made this year—include a switch to refinery runs as a sole basis of allocations, and pegging over-all quotas on crude demand rather than on total demand. . . . p. 20

•

Refiners are pinning their hopes for the '60s on better planning of refinery runs and new technology. A Petroleum Week Special Report shows they are cautiously optimistic about the future. . . . p. 44

•

A group of leading economists have trimmed their sights some on the 1961 demand outlook. Their forecast this week places total demand at 9,993,000 b/d, up 114,000 b/d over 1960, but 105,000 b/d less than they predicted last fall. . . . p. 15

•

More effective hydrodesulfurization catalysts are helping refiners upgrade the bottom of the barrel. This enables them to produce better, lower-sulfur fuel oils. . . . p. 68

•

Improperly plugged old wells are causing a lot of headaches—particularly in the Mid-Continent area. Costs of reentering and plugging these wells range from $600 to more than $10,000. . . . p. 28

•

Watch for more governments to get into the oil price act. The U. S., the Common Market Authority, Uruguay, Brazil, and OPEC are all part of the move, which is perhaps the most significant trend in recent years. . . . p. 81

•

Lack of understanding is at the root of a serious break in relationships between dealers and attendants. A new nationwide survey found that service stations are becoming infected with an atmosphere of drudgery and bitterness. . . . p. 83

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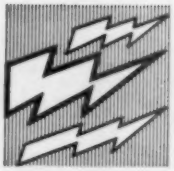
The Last Issue of Petroleum Week

Petroleum Week ceases publication with this issue. There are a considerable number of subscriptions with many months to run. Those subscribers whom we believe will be benefitted by some of the other related business magazines will be offered an exchange for their unexpired subscriptions—or a refund.

Up to the Minute



SIGNIFICANT LATE NEWS

PETROLEUM WEEK

May 5, 1961

Gasoline prices declined 1¢ a gal. in the Mid-Continent spot market this week, reflecting prolonged weakness in many retail areas. The drop trimmed wholesale prices for 99-octane premium in the Oklahoma northern shipment market to 14.25¢ a gal. The price of 91-octane regular was reduced to 11.5¢ a gal.

•

There's a possibility that oil may challenge the legality of subsidies by gas and electric utilities in the home-heating market. The American Petroleum Institute's Fuel Oil Committee, after listening to case histories of builder subsidy programs that, in effect, froze out oil heat competition, voted to put the matter up to API's legal committee for a ruling. The subsidy programs provide for builder installation of gas or electric heating units in preference to oil-fired furnaces.

•

Oklahoma deferred the scheduled application of its new depth-acreage factor to allowables because of a lack of data on unallocated wells. The Corporation Commission, after striving for three days to arrive at a percentage factor, as prescribed by the new rules, gave up and set a 15 b/d per well minimum allowable for May—a cut of 2 b/d per well, or about 12% from April. This is expected to result in an output of about 520,000 b/d. The commission is trying to obtain data on unallocated wells, with the expectation that the depth-acreage factor can be applied next month.

•

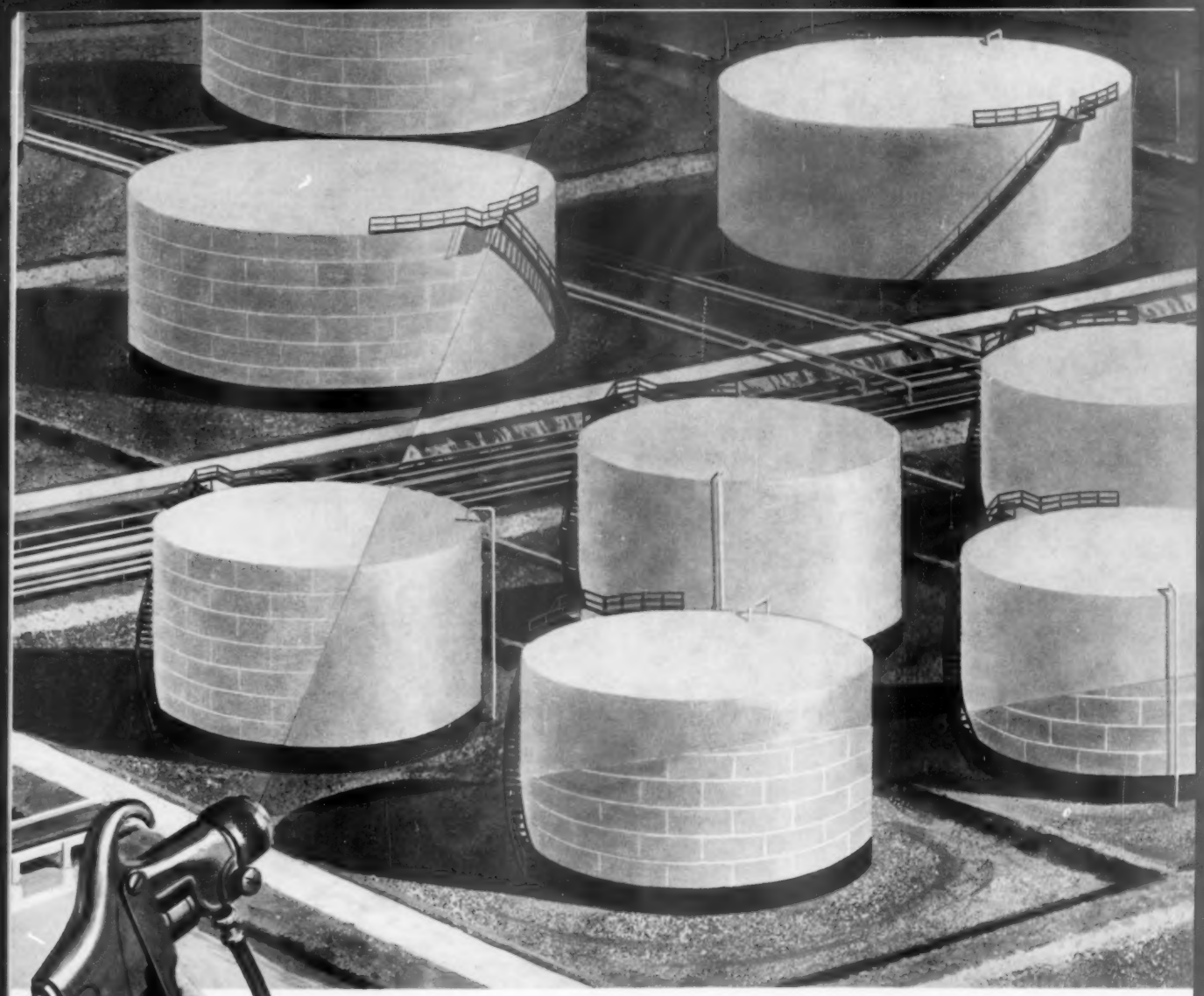
A tempest in a teapot erupted in Washington at midweek over an oil man's letter about a Democratic fund-raising dinner. Newspapers throughout the country made a great to-do about the letter signed by J. K. Evans, Washington representative of Asiatic Petroleum Co., and longtime personal friend of Interior Secretary Stewart L. Udall. The letter, which went to Evans acquaintances in the petroleum industry in Washington, urged them to participate in the $100-a-plate dinner tribute to President Kennedy. Secretary Udall said he was "flabbergasted" by the letter and that apparently there was a misunderstanding over his suggestion to Evans to bring a few friends to the dinner.

•

Senate confirmation of Joseph C. Swidler and Howard V. Morgan to the Federal Power Commission is anticipated later this month, following a vote in the Senate Commerce Committee slated for May 16. This week, the committee questioned both men closely—Swidler on his ideas for ending the FPC backlog, and Morgan on his failure to list minor arrest charges in his youth on his government employment form.

•

Oil imports from Mexico through Brownsville, Tex., have been limited to 30,000 bbl. per day for three years. Interior Secretary Stewart L. Udall said that officials of Pemex agreed that this amount will include a minimum of 10,000 bbl. per day of residual fuel oil, with the rest to be heavy crude of not over 15-gravity.



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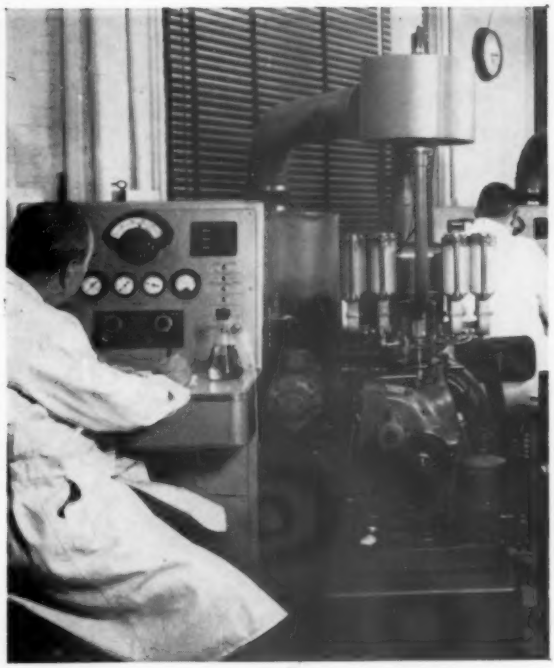
WHICH ANTIKNOCK AND HOW MUCH?

1. In one of Ethyl's five gasoline testing laboratories, customers' gasolines are blended with TEL, TML, "MLA" (mixed lead alkyls), and "TELMEL" (physical mixtures of TEL and TML), in concentrations ranging from 1.06 to 3.17 grams of lead per gallon.



2. Each sample is rated for Research and Motor octane number. In addition, distillation, vapor pressure, sulfur, gravity, and percentage aromatics, olefins and saturates are determined. Altogether, each sample is subjected to over 80 separate tests.

5. The report is discussed with the refiner. Here C. A. Cole, Chief Refinery Technologist, in the Eastern Region, and D. J. Chapman, National Account Representative, point out highlights of such a study.

6. When the laboratory work indicates a potential gain from changing antiknocks, tests of selected gasolines are made on Ethyl's controlled-weather chassis dynamometers in Detroit.

3. A comprehensive computer program, designed by Ethyl's Dr. W. C. Healy, Jr., shows cost effectiveness of each antiknock at each concentration for a range of given octane numbers, as well as octane numbers obtainable for a range of costs.

4. The results of each customer program are thoroughly reviewed by Ethyl's Refinery Technology Division at the Detroit Research Laboratories. Here T. W. Warren and L. E. Stinson put the final touches on the assembled data.

HERE'S ETHYL'S ANSWER: *An expanded service that matches gasoline composition and antiknock . . . helps to blend fuels that meet the individual refiner's needs at lowest cost.*

Having many antiknocks to choose from gives refiners a new opportunity to improve gasoline performance and/or save money on refining costs. However, they add a complicating element to an already complex problem—how to achieve optimum balance between refinery processing and antiknocks. In Ethyl's view, refiners should be able to look to their antiknock supplier for help in solving this problem.

Ethyl's service rates eight "Ethyl" antiknocks in customers' gasolines, to establish the relative benefits of each at varying concentrations. The photographs illustrate this service. For further information on Ethyl's wide range of antiknock compounds, and the complete line of services that go with them, call your Ethyl Representative.

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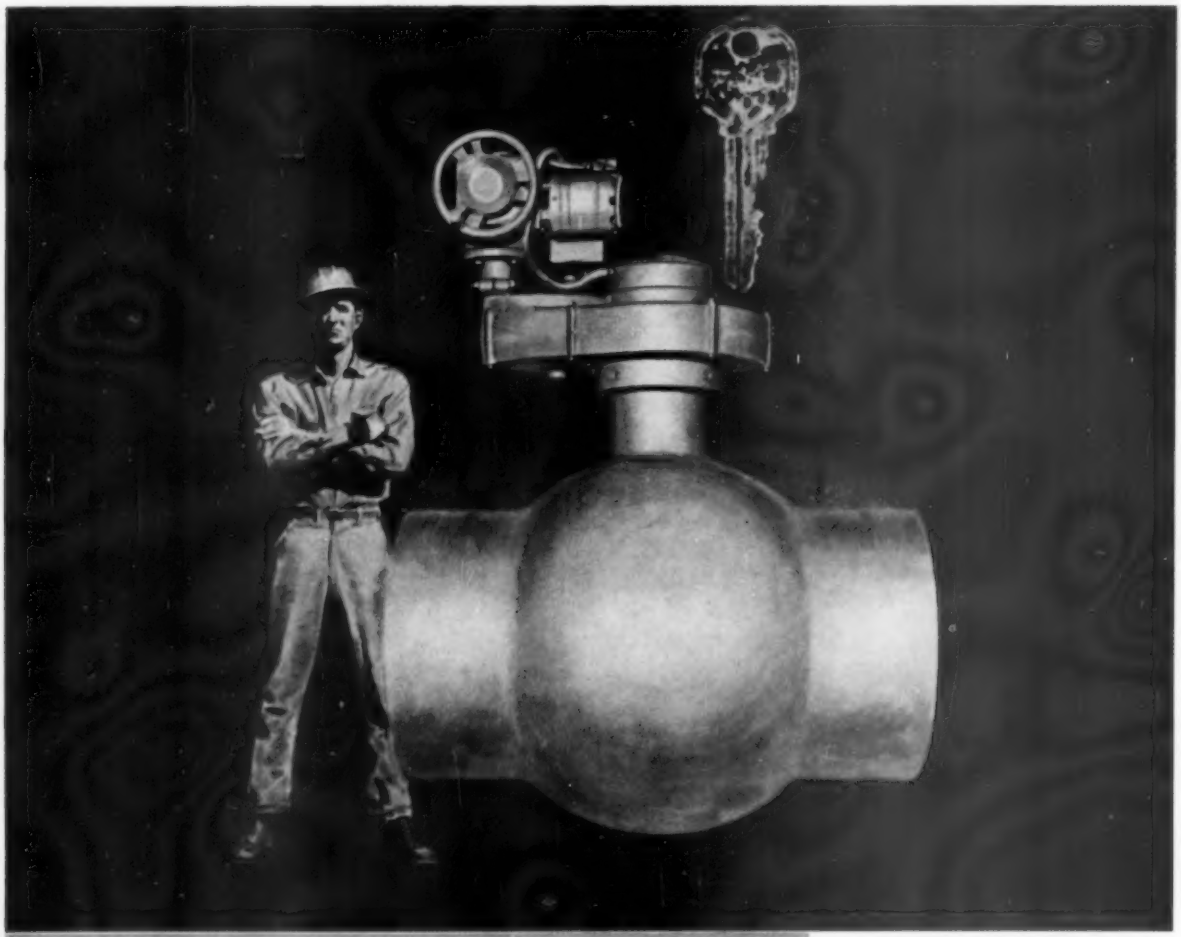

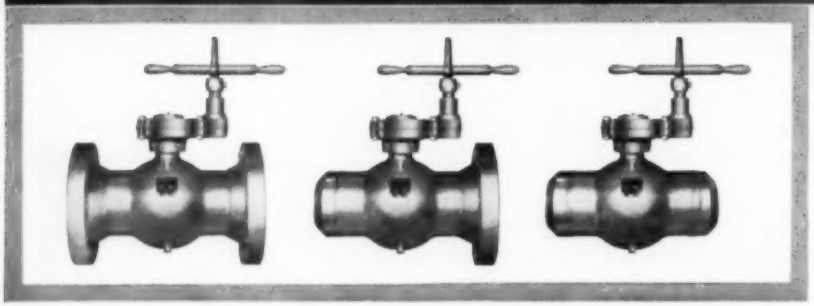

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Total Demand Expected to Rise 1.2% With Crude Output Up Slightly in '61

A group of leading economists reporting to the Independent Petroleum Assn. of America are not quite as optimistic over the demand outlook now as they were last fall. Their optimism has declined by 105,000 b/d.

This week's report on IPAA's Supply & Demand Committee forecasts that total demand for the year will average 9,993,000 b/d, an increase of 114,000 b/d, or 1.2%, over 1960, but 105,000 b/d below the group's forecast of last October.

The committee, headed by N. G. Dumbros, of Ohio Oil Co., predicts that domestic demand for all of 1961 will average 9,818,000 b/d, up 1.5% over last year. Its forecast of domestic demand is 82,000 b/d below the prediction it made in the fall.

The group's predictions for 1961 are based on the fact that the general economic outlook "now appears to be on the verge of an upturn."

But the petroleum economists note that "a careful study of the individual segments of the economy does not reveal any significant forces comparable to those which brought the rapid recoveries of the past three recessions.

"It appears, nonetheless, that economic activity will be rising—though moderately—during the remainder of the year, and that another year of limited growth in the petroleum industry is in the making."

The basis of the group's prediction on the general economy are pegged to its expectations of the two leading indexes of economic activity:

The economists forecast that the gross national product will amount to $509-billion in 1961, compared to $503-billion in 1960. And they expect the Federal Reserve Board's index of industrial production to average 105% of the 1957 average in 1961, down from 108% in 1960.

The over-all gain in demand in 1961 will stem primarily from an expected "substantial" increase in commercial jet fuel requirements, and greater motor gasoline and specialty products sales, the group reports.

The most noticeable impact of increased domestic commercial jet fuel use is in the forecast of kerosine demand, which is for an average of 384,000 b/d, up 5.8% over 1960. Domestic demand for motor fuel is expected to rise a modest 1.9% to an average of 4,236,000 b/d.

The specialty products, included in the "other" demand category, are asphalt, lubes, waxes, and liquefied gases. Domestic demand for all those is expected to rise 4.8%.

The economists predict that new supply required to fill demand will rise by 165,000 b/d over 1960, and that domestic crude production should increase by 69,000 b/d.

The over-all optimism of the group in the supply situation is somewhat damped by present burdensome inventories.

"It is already apparent that supply conditions during the second quarter will be such that little reduction can be made in the surplus stocks that accumulated during the first quarter," the group notes.

"However, during the second half of 1961 it is estimated that the industry can work off some of the burdensome surplus which now exists. Even the reductions in inventories now estimated by the committee will not bring inventories to the target levels which this committee indicated were sound in its report of six months ago."

The group predicts that domestic crude production this year will increase by 69,000 b/d over 1960 to

U.S. Petroleum Supply-Demand Forecast

(Thousands of b/d)

	1st Q 1961	2nd Q 1961	3rd Q 1961	4th Q 1961	Year 1961	% Change '61-'60
DOMESTIC DEMAND						
Gasoline	3,814	4,450	4,490	4,190	4,236	+ 1.9%
Kerosine	499	250	300	485	384	+ 5.8
Distillate	2,613	1,410	1,250	2,265	1,885	+ 0.3
Residual	1,839	1,305	1,180	1,575	1,487	— 3.1
Other	1,660	1,785	1,980	1,875	1,826	+ 4.8
Total	10,475	9,200	9,200	10,390	9,818	+ 1.5
EXPORTS						
Gasoline	26	40	35	30	33	—10.8
Kerosine	1	.....	.....	.....	.....	.....
Distillate	17	25	20	15	19	—29.6
Residual	36	35	35	35	35	—31.4
Other	85	90	90	90	88	+ 3.5
Total	165	190	180	170	175	—13.4
TOTAL DEMAND	10,640	9,390	9,380	10,560	9,993	+ 1.2
Stock Change	— 229	+ 336	+ 287	— 522	— 32	.....
New Supply	10,411	9,726	9,667	10,038	9,961	+ 1.7
Runs to Stills	8,290	7,869	8,058	8,206	8,107	+ 0.2

Estimated Components of New Supply

(Thousands of b/d)

	1959	1960	Change	1961	Change
Domestic Demand	9,451	9,677	+ 226	9,818	+ 141
Export Demand	211	202	— 9	175	— 27
Total Demand	9,662	9,879	+ 217	9,993	+ 114
NEW SUPPLY					
Domestic Crude	7,054	7,035	—19	7,104	+ 69
Nat. Gas Liquids	879	942	+ 63	997	+ 55
Total Production	7,933	7,977	+ 44	8,101	+ 124
Imports	1,780	1,819	+ 39	1,860	+ 41
Total	9,713	9,796	+ 83	9,961	+ 165
Stock Change	+ 51	— 83	.....	— 32	.....

7,104,000 b/d, and that natural gas liquids output will average 997,000 b/d, up 55,000 b/d.

The committee estimates that, based on the existing import control program, imports of crude and products in 1961 will amount to 1,860,000 b/d. On that basis, imports this year will be up 41,000 b/d over 1960, accounting for 25% of the increase in total supply.

The committee's decline in optimism also was reflected in the views of Rep. Frank Ikard (D. Tex.), who told the producers that domestic production has been "flat for five years" as imports grew.

The mandatory control program has done "a commendable job," he said, but noncontrolled imports from Canada and Mexico, and imports of bunker oil, keep the total climbing.

"In my opinion," he said, "preferred treatment as to imports from Canada and Mexico must only, and can only, last so long as such imports are reasonable and within the spirit of the oil import program."

Clayton L. Orn, general attorney of Ohio Oil Co., predicted to the independent producers that area pricing of gas on a public utility basis is doomed to the same failure as the case-by-case pricing attempt.

The gas producing industry, he noted, simply does not lend itself to public utility rate regulation. The proposed area pricing plan of the Federal Power Commission will be a "dismal" failure if the courts hold that FPC must arrive at "just and reasonable" rates for groups of producers by using public utility rate regulatory methods, he said.

The commission, he explained, has spent seven years trying to fix independent producers' gas rates on a case-by-case basis as though they were public utilities.

FPC failed in the effort, he said, not because of its ineptitude or producers' intransigence, "but because of the fundamental characteristics inherent in the oil and gas producing industry."

"To those who believe in our competitive system," he observed, "it would appear indisputable that consumers will best be protected from exploitation by producers if their gas supplies are purchased by pipeline carriers at the prevailing market price."

Area rates for independent producers will work, Orn predicted, if FPC determines such rates on the basis of the reasonable market price of gas and the reasonable revenue requirements of the gas producing industry.

U.S. Petroleum Productive Capacity

in thousands b/d Jan. 1

	1954	1955	1956	1957	1958	1959	1960	1961
Crude and Lease Condensate								
East Coast	48	40	38	35	34	27	28	28
Mid-Cont.	1,325	1,473	1,532	1,560	1,549	1,542	1,534	1,526
Southwest	4,952	5,282	5,690	5,990	6,225	6,367	6,476	6,668
Rocky Mtn.	466	547	569	585	625	670	670	700
West Coast	1,135	1,100	1,100	1,080	1,060	1,050	1,000	970
Total	**7,926**	**8,442**	**8,929**	**9,250**	**9,493**	**9,656**	**9,708**	**9,892**
Processed Nat. Gas Liquids								
East Coast	22	12	14	15	14	16	20	26
Mid-Cont.	115	130	140	145	145	131	140	170
Southwest	502	526	560	580	605	660	685	725
Rocky Mtn.	10	12	13	15	21	28	32	35
West Coast	95	98	98	95	95	95	90	85
Total	**744**	**778**	**825**	**850**	**880**	**930**	**967**	**1,041**
Total Petroleum Liquids								
East Coast	70	52	52	50	48	43	48	54
Mid-Cont.	1,440	1,603	1,672	1,705	1,694	1,673	1,674	1,696
Southwest	5,454	5,808	6,250	6,570	6,830	7,027	7,161	7,393
Rocky Mtn.	476	559	582	600	646	698	702	735
West Coast	1,230	1,198	1,198	1,175	1,155	1,145	1,090	1,055
Total	**8,670**	**9,220**	**9,754**	**10,100**	**10,373**	**10,586**	**10,675**	**10,933**

Productive Capacity Gains 2.4%

U.S. productive capacity of petroleum liquids increased 2.4% in 1960, rising to a new peak of 10.9-million b/d, according to the Independent Petroleum Assn. of America.

The estimate was provided by the Association's Productive Capacity Committee, headed by Joe M. Haas, of Dallas. It was one of the highlights of this week's IPAA meeting.

Haas defined productive capacity as the "average rate of production from existing wells that could be maintained for a period of from six to twelve months without further development, and with no significant loss in ultimate recovery."

The 1960 increase in productive capacity amounts to 258,000 b/d. This is much better than 1959's 89,000 b/d, and tops the 1958 and 1957 increases too. But it's far below the 500,000 b/d annual additions of the middle 1950s.

The study committee estimated productive capacity as of last Jan. 1 at 10,933,000 b/d, of which 9,892,000 b/d represented crude and condensate, and 1,041,000 b/d processed natural gas liquids.

In its breakdown of the statistics, the committee reported that crude productive capacity increased 184,000 b/d during 1960, compared with annual increases of 52,000 b/d in 1959, and 163,000 b/d in 1958.

Since actual production in January amounted to only 8.2-million b/d, this means that the industry has an excess capacity of 24.9%.

This is about par for the course for the past several years.

The actual unused capacity, based on January figures, was 2,724,000 b/d. Of this, 2,682,000 b/d represented crude and lease condensate, and 42,000 b/d processed natural gas liquids.

The committee credited exploration and development activity, and continuing advances in producing and recovery technology, as the principal reasons for the 1960 gain.

IPAA's Cost Study Committee reported that rotary drilling and completion costs edged up slightly in 1960, to set new peaks.

The committee revised its figures for 1947 through 1959 to reflect more reliable information, and came up with a 1960 index of 177.2 for rotary drilling costs, and 151.0 for completion costs per foot.

This means that the cost of drilling and completing a rotary well in 1960 was up 77.2% over the 1947-1949 base period, and the composite cost per foot was up 51%, on the same basis.

A new series on average contract rates provided these figures for footage costs: 1960—$4.11; 1959—$4.33; 1958—$4.27; 1957—$4.51.

Gas Producers May Get Action Soon

The long struggle over gas producer regulation may be coming to a head, with decisive action possible in the near future in the Federal Power Commission, the federal courts, or Congress.

New battle lines have been formed in the past eight months, since FPC adopted area pricing, and since the Kennedy Administration endorsed decontrol of small producers.

Pressure for a solution is high everywhere, and a firm move from FPC, after it is constituted under Kennedy appointees, or from the courts, or from Congress, could topple the other two in either of two directions.

A clear-cut split is shaping up, with consumer-oriented advocates of small-producer decontrol and utility-type regulation for major producers on one side, versus producer supporters of area pricing based on reasonable market price and general cost evidence, on the other.

The extreme positions in the dispute seem to be withering. Producer hopes of eventual freedom from regulation have largely disappeared; the most zealous regulators no longer have faith in utility-type controls for all producers.

In the background, there is the strongest recognition yet among consumer-state spokesmen that the gas industry is being jeopardized by indecision.

Congressional investigations, President Kennedy's pinpointing of the FPC crisis, and new statistics showing inadequate exploration and fewer discoveries have highlighted this.

Rep. Oren Harris (D., Ark.) may get his Commerce Committee moving this year on hearings on the various proposals to solve FPC's problems. Congress is therefore likely to become a battleground again.

Congress won't be functioning in a vacuum, however, and either FPC or the courts could take the lead.

A fear being expressed in all segments of the gas industry is that Congress will attempt some peripheral remedies, such as increasing the size of FPC, without coming to grips with the crucial question: How should producers be regulated?

Harris is showing a willingness to try to avoid this by urging the industry to unite on a gas bill acceptable to pipeliners, producers, and distributors. Such legislation, he feels, would have a good chance for success.

With unity on authorizing FPC to control producers on an area basis—without cost-of-service—the drawbacks of decontrol of producers who sell less than 2-billion cu. ft. of gas annually can be demonstrated, it is felt.

For one thing, the goal of area pricing is to balance the financial needs of producers against the interest of consumers in low prices.

This goal would be hard to meet without considering small producers.

A split among distributors appears to be a big stumbling block to unity.

This division showed up clearly in recent Washington conferences on Permian Basin area prices.

Consolidated Edison Co. of New York, and Public Service Electric & Gas Co., of New Jersey, showed a willingness to compromise to make area pricing work; California utilities refused to give any ground in their demand for individual-company cost data.

Lawyers for big producers discount the claim of some distributors that they are under heavy pressure from their state regulatory commission to hold out for cost-of-service. Producers point to the consumer views of the New York and New Jersey commissions.

Producers feel some distributors are trying to stall the Permian Basin proceeding, hoping that the courts, Congress, or FPC under a new majority will bring them back to cost-of-service regulation.

Although many producer rate cases decided on cost-of-service principles have shown that producers are selling for less than their costs, a new FPC would be free to alter the allocation principles.

FPC is expected to kick off its formal hearing on the Permian Basin in mid-July, probably in Washington.

The progress of this first test of area pricing is still expected to weigh heavily with new FPC members.

After a fruitless round of prehearing meetings, in Midland, Tex., and in Washington, there were predictions that the formal phase would take from two to four years.

William J. Merrill, an attorney for Humble Oil & Refining Co., plans a last-stand try at salvaging the Permian Basin hearing.

Merrill is convinced that "quibbling and nitpicking" are threatening to damage all the gas industry, and the public interest as well.

Merrill told PETROLEUM WEEK that he will try, between now and the start of formal hearings, to get producers and distributors together with the FPC staff on fundamental issues.

If all sides sit down in good faith, Merrill believes, there is no reason why agreement can't be reached on the rate of increase in demand for the future, reserves now available, and the amount of new reserves that must be found to meet demand.

Merrill points out that the American Gas Assn. and the American Petroleum Institute have highly regarded statistics on reserves.

Agreement on reserves, demand, and need for new reserves, Merrill says, would leave one basic issue for the area hearing: What is the lowest price for gas that will stimulate the industry to find the needed reserves?

With such an approach, finding a nationwide "just and reasonable" price—or range of prices—for gas could be easier. Differences could be worked out to compensate for local producing area differences.

Changes in prices generally could be pegged to a set of statistics showing changes in industry costs of production, drilling, and exploration.

Furthermore, a continuing check on the trend in demand and the discovery of new reserves would give FPC a reliable gauge of whether gas prices were too high or too low.

Merrill, like many other producer spokesmen, believes that area pricing is the only hope for a practical method of producer regulation.

Hearing Examiner Edward B. Marsh endorsed Merrill's approach. He is now preparing his report to FPC on the prehearing phase of the Permian Basin proceedings.

Some industry spokesmen believe that area pricing could be put on a sound basis by legislation, court action, or a positive approach by an FPC dominated by Kennedy appointees.

FPC's Phillips decision, scrapping cost-of-service in individual producer rate cases, is now before the U.S. Court of Appeals for the District of Columbia.

A ruling upholding FPC would be a boost for the area pricing concept in Congress, and with the new FPC members.

FPC Chairman Jerome K. Kuykendall believes the Federal Courts are beginning to understand the complexity of producer regulation on a cost-of-service basis, and predicts that the courts will uphold FPC.

First-Quarter Earnings Look Good

(thousands of dollars)

	First quarter 1961	First quarter 1960	% Change 1961/1960
Atlantic Refining	14,870	8,726	+70.4
California Standard	65,973	60,728	+ 8.6
Cities Service	14,752	12,974	+13.7
Colorado Oil & Gas	1,136	(180)	.....
Commonwealth Oil Refining	3,275	(331)	.....
Continental Oil	16,000	15,280	+ 4.7
Delhi-Taylor	2,100	1,425	+47.4
Gulf Oil	95,315	81,824	+16.5
Jersey Standard	193,000	170,000	+13.5
Ohio Oil	10,493	10,279	+ 2.1
Ohio Standard	5,518	5,066	+ 8.9
Phillips Petroleum	27,506	25,804	+ 6.6
Shell	34,709	34,545	+ 0.5
Socony Mobil	59,800	47,200	+26.7
Sun	12,000	8,790	+36.5
Sunray Mid-Continent	10,174	8,580	+18.6
Tennessee Gas Transmission	12,115	10,134	+19.5
Texaco	108,141	97,313	+11.1
Texas Pacific	1,799	2,104	−14.5
Union Oil	9,164	5,530	+65.7

Chances are good that 1961 earnings will make up for oil's recent lean years, what with a solid base of strong first-quarter earnings and an upturn in the economy forecast for the coming months.

Top oil executives, in fact, are more confident now about the profits picture than they have been in years.

Says Sunray Mid-Continent Oil Co.'s president, Paul E. Taliaferro: "It is my belief that if industry conditions remain at, or near, present levels, and if product prices continue to be satisfactory, the industry will be able to improve profits in 1961 over 1960.

"It continues to be my belief that the oil industry, while it faces a number of difficult problems, is one that is essential to the growth and security of our nation and therefore will continue to thrive, and that Sunray is well situated and organized to make the most of its opportunities in this dynamic business of providing energy fuels to an ever increasing market."

Henderson Supplee, Jr., president of Atlantic Refining Co., agrees: "With better economic conditions forecast for the months ahead, we are hopeful that product demand will pick up and favorable prices will continue. This outlook, plus our strengthened internal position, should result in a good year for Atlantic."

By contrast, general corporate profits were off generally during the first three months—oil was one of only four industries that registered gains over last year. Besides the oil industry, the moneymakers were the aircraft, motion picture, and office equipment industries.

Oil's strong first quarter was largely the result of more realistic product prices, increased production of crude and natural gas, and greater efficiency in operations.

The quarter's earnings might have been higher, but March income was adversely affected by deterioration of gasoline prices as a result of heavy inventories, and by lower demand for fuel oils than in the previous March.

Excess gasoline stocks, according to Socony Mobil Oil Co.'s president, Albert L. Nickerson, were "due to the high level of [refinery] operations during the first two months of the year to meet heating oil demand."

Atlantic Refining Co. scored the largest increase in earnings.

Atlantic reported earnings of $14.9-million, up 70.4% from the first quarter of 1960. It was the second-highest net for any first quarter, the company says, and, exclusive of capital gains, the best first-quarter performance in the company's history.

The gain reflected the continuing benefit from an improved raw-material position, lower operating costs, and a more profitable mix of products, Supplee told stockholders.

Atlantic's crude production reached a new high of 161,100 b/d, or nearly 81% of the company's refinery needs, compared to 78% a year ago. Venezuelan production increased from 44,800 b/d to 54,100 b/d.

Supplee added: "Although allowable producing days in Texas were down 10% from the first quarter of last year, we were able to maintain domestic production within 2% of the 1960 level."

Atlantic's expenses were $1,655,000 below the first three months of 1960, despite an increase of over $2-million in taxes.

Texaco Inc., Gulf Oil Corp., and Colorado Oil & Gas Corp. reported all-time-high first-quarter earnings, while Socony Mobil enjoyed its best first quarter since 1957, and its third-highest in any first quarter.

The real boost to 1961 earnings is expected to come in the third and fourth quarters. But a fly in the ointment could be too-high runs and heavy inventories.

Commenting on inventories, Texaco's chairman, Augustus C. Long, warned that refiners who constantly seek to run at full capacity, and to sell the resulting products outside their normal channels, cannot do so without adversely affecting market prices.

Texaco's policy, Long said, is to "run to its requirements,"—to adjust refinery runs on a weekly or sometimes almost a daily basis, in accordance with inventory levels.

"If more refiners followed a similar policy," he advised, "the result would be a greater stability of operations and prices, which would be beneficial to the industry as well as to consumers."

Ex-Im Bank Signs First Credit Pact

The Export-Import Bank signed its first contract this week to guarantee payment on U.S. oil-equipment purchases by foreign companies and governments.

Some 15 to 20 other such transactions are pending, and these could be forerunners of a new era of business for U.S. firms and overseas customers.

Acting jointly with the Chase Manhattan Bank of New York, the Export-Import Bank guaranteed a $1.5-million sale of separation and crude-metering equipment by National Supply Division of Armco Steel Corp. to Argentina's Yacimientos Petroliferos Fiscales.

Under the credit plan, YPF paid 20% down—or about $300,000 in cash—to National Supply. The two banks paid the company $610,000 each, and received nonrecourse notes from YCF.

The notes have average four-year maturity.

Stripper Reserves Up 8.4%

Crude reserves in stripper fields in the U.S. appear on the upswing again after a one-year decline.

The latest stripper well survey compiled by the Interstate Oil Compact Commission estimated primary and secondary reserves in stripper fields at 7,456,321,000 bbl. on Jan. 1, 1960, an increase of 8.4% over the previous year.

Secondary reserves were placed at 3,351,307,000 bbl., a decline of 2.7% from January, 1959.

California has had the largest gain in stripper field reserves, a jump of 122% to 1,195,343,000 bbl.

The state's output from strippers declined slightly in 1959 (the latest year for which full data are available) to 60.9-million bbl., and the number of stripper wells increased slightly to 21,317.

Stripper reserves in Illinois rose 40.6% to 586,709,000 bbl., and production declined 3.3-million bbl. to 76,459,000 bbl.

Michigan's stripper reserves increased 11.6% and Indiana's reserves rose 7.3%.

The most significant decline in stripper reserves has occurred in Oklahoma, with a drop of 10.2%.

The state's primary and secondary reserves in the stripper fields declined to 1.2-billion bbl., while production increased to 91.3-million bbl. from 86.3-million bbl.

The number of stripper wells there increased to 68,836 on Jan. 1, 1960, from 62,905 a year earlier.

In Texas, stripper reserves declined 3.8% to just over 2-million bbl. Production increased to 160.6-million bbl. from 145.5-million bbl.

The number of stripper wells rose to 84,690 from 77,920.

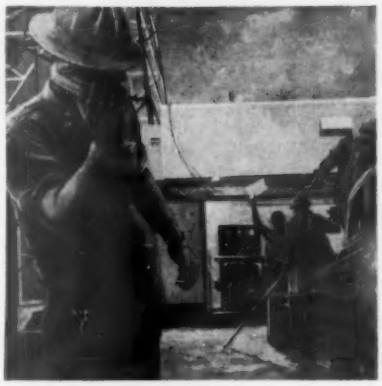
Production from stripper fields increased by 4.2% to 533,470,000 bbl.

The average production per stripper well in 1959 amounted to 3.75 b/d, down 0.8% from 1958.

Mississippi fields had the highest output per well of 12.57 b/d.

	No. of Stripper Wells	Production from Strippers (000 bbl.)	Average Production Per Well (b/d)	Secondary Reserves (000 bbl.)	Total Primary and Secondary (000 bbl.)
Arkansas	4,791	8,700	4.98	45,980	89,710
California	21,317	60,909	7.83	507,250	1,195,343
Colorado	391	1,356	9.50	1,435	12,030
Illinois	28,430	76,459	7.37	.....	586,709
Indiana	4,744	10,471	6.05	39,500	91,850
Kansas	35,000	56,705	4.39	96,685	415,683
Kentucky	11,275	13,442	3.27	40,000	93,500
Louisiana	9,182	12,358	3.69	69,800	168,600
Michigan	3,373	10,439	8.48	109,295	183,042
Mississippi	182	835	12.57	.....	6,680
Missouri	121	75	1.70	.....	575
Montana	3,077	3,675	3.27	111,143	144,794
Nebraska	58	139	6.56	1,750	2,680
New Mexico	1,226	2,386	5.33	37,000	56,088
New York	14,900	1,914	0.35	31,000	88,700
North Dakota	80	148,555	5.09	3,905	5,130
Ohio	16,934	5,978	0.97	5,000	58,900
Oklahoma	68,836	91,329	3.63	661,371	1,242,244
Pennsylvania	64,340	5,896	0.25	380,110	493,684
Tennessee	32	9	0.80	.....	63
Texas	84,690	160,551	5.19	826,243	2,026,102
North	27,589	41,674	4.14	356,200	710,308
West Central	11,319	15,041	3.64	100,620	217,728
Other	45,782	103,837	6.21	369,423	1,098,066
Utah	15	10,197	1.86	.....	80
Virginia	13	3,992	0.84	.....	20
West Virginia	15,800	2,184	0.38	50,840	86,114
Wyoming	3,328	7,498	6.17	333,000	408,000
Total	**392,535**	**533,470**	**3.72**	**3,351,307**	**7,456,321**

THE RACE BELONGS TO THE SWIFT



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API's Porter Scores Tax Proposals

Tax policies that would blunt American development of foreign oil resources were branded "absolute folly" this week by F. M. Porter, president of the American Petroleum Institute.

Porter keynoted the 30th annual meeting of the Liquefied Petroleum Gas Assn., in Chicago. Intermingled with his laudatory comments was an alert to oil men to "danger areas . . . that threaten the oil industry as a whole."

These, he said, included a mounting attack on percentage depletion, severe government regulation of natural gas producers, and coal's campaign for end-use controls on fuels.

Porter was particularly vigorous about proposals that would repeal or reduce percentage depletion for U.S. firms producing oil overseas.

"Is there any sense or sanity," he asked, "in pouring out billions of dollars in foreign aid to further the economic development of overseas lands, then adopting a tax policy that would have the direct effect of discouraging —even virtually preventing—American companies from participating in the development?

"Let us remember," he declared, "that if American companies are driven away from [foreign] ventures by the tax policies of our own government, other countries—including our foremost rivals—will be free to step into the areas we forced our nationals to vacate."

These overseas oil resources will be developed by someone, he went on, and "if we want to lose this crucial battle of the cold war, reducing the foreign depletion rate is one way to do it."

The API president said it has been demonstrated already that reducing or repealing the percentage depletion rate on oil produced abroad by American companies wouldn't "add an additional dime of revenue to the coffers of our federal government."

The factor that must be kept in mind, in discussing such proposals, he said, "is the utter and absolute folly of adopting a measure that would put American companies at a hopeless disadvantage in developing the oil resources of foreign lands."

He accused opponents of percentage depletion, for both domestic and foreign tax purposes, of playing politics and of pursuing a divide-and-conquer strategy.

Porter said their ultimate goal is elimination of percentage depletion for all extractive industries, and that they hope to whittle the oil industry's rate piece by piece.

The strategy they are using, he said, is "known as being flexible, or bending a principle to play politics."

Where natural gas is concerned, Porter contended, consumers and producers have suffered enough "from trying to harness an industry with regulations that do not fit, and cannot to be made to fit."

It is time, he said, that advocates of this kind of regulation face up to realities and recognize that their theories have failed.

Freeing the small producer is a partial admission of such failure, the API president said. "Why not go all the way and recognize that this theory does not work in practice on any size or shape of gas producer? It has been given a try, and proved useless."

He warned, however, that history has shown that advocates of faulty regulation—instead of admitting their error—invariably try to remedy things with bigger doses of the "same poisonous medicine."

Coal's campaign has been checked momentarily, Porter concluded, but the fight is far from finished.

Import Changes Appear Certain

Interior Dept. administrators are searching for ways to tighten up the mandatory oil import control program to try to pull domestic production out of the doldrums.

That is a widely held view as the department gets under way with its complete reappraisal of import controls on crude and products.

Hearings start this week in Los Angeles, under John M. Kelly, Assistant Secretary for Mineral Resources, and will continue in Washington next Wednesday and Thursday with Kelly, and probably Interior Secretary Stewart L. Udall, on deck.

Increasing Canadian imports into the Pacific Northwest, the continuing problem of shipments back and forth between District 5, and Districts 1 through 4, east of the Rockies, and the adequacy of forecasting methods for West Coast demand were of chief concern this week.

Officials may weigh the possibility of wiping out the distinction in the administration of controls between the areas east and west of the Rockies.

Many complaints have arisen from the arbitrary barrier, and the two different approaches to controls. West Coast imports are intended to make up the difference between supply and demand, while imports east of the Rockies are based on a percentage of total demand.

When residual fuel oil controls were studied by Interior officials earlier this year, Florida made a case for special treatment, but the government's view was that oil would flow where the demand was, when it was needed, so long as oil was available.

The industry is now asking if Interior will take the same view on the admittedly much more complex question of West Coast controls.

Prospects are for some changes to be made in time for second-half allocations—with more modifications later. These may include:

- A switch to an annual basis for crude and products allocations—similar to the action on residual quotas.
- A change to demand for crude as the basis for import allocations rather than over-all demand.
- A gradual phasing-out of historical importers, and a switch in the basis of individual allocations to refinery inputs. That, also, would follow the pattern set for residual allocations.
- The imposition of some limits on overland imports from Canada and Mexico. But such a change would be tricky, and would need State Dept. approval.

One possibility is that a "reasonable" exempt level may be set for Canada and Mexico and additional imports from those two countries would be deducted from over-all allocations.

Nothing is likely to be done about cutting out import allocations for inland refiners that can't economically refine foreign crude.

Such allocations, and the system of swapping foreign crude for domestic crude at a premium, have come in for much criticism as a major weakness of import controls.

There is no reason to suspect that imports officials are happy about it, but it is generally agreed that their hands are tied.

The political potency of small business is regarded as a block to ending allocations for inland refiners.

new Dowell acidizing aid boosts production–improves success ratios

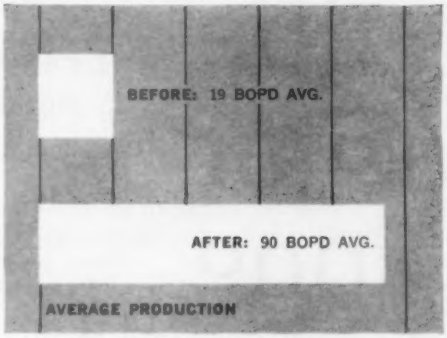
Slugs of gelled water injected between batches of acid are effective temporary plugs when acidizing long pay sections. Here are results from 21 wells.

Operators in many areas have found that Dowell water gels provide an economical temporary plug for use in the selective acidizing of long pay sections. These gels contain a breaking agent which causes the gelled water to revert to a thin liquid, primarily by hydrolysis. Breakdown time varies with gel concentration, the presence of acid, and temperature. Overall treatment cost to the operator is often unusually low for the production improvement realized.

As an example, 21 oil wells in the delta area of South Louisiana were acidized using slugs of water gel between stages of acid. Production was from a series of dirty, poorly consolidated Miocene sands interbedded with silt, clay and mudstone. Depths of these wells ranged from 6400 to 11,000 feet. Here is a tabulation of results from all 21 wells:

WELL NUMBER	LOCATION	PRODUCTION BEFORE TREATMENT, BOPD	PRODUCTION AFTER TREATMENT, BOPD
1	WEST DELTA	8	8
2	WEST DELTA	63	312
3	WEST DELTA	0	17
4	WEST DELTA	41	144
5	WEST DELTA	30	216
6	WEST DELTA	42	140
7	WEST DELTA	0	223
8	WEST DELTA	35	108
9	WEST DELTA	60	203
10	WEST DELTA	0	30
11	WEST DELTA	20	22
12	WEST DELTA	24	24
13	WEST DELTA	7	35
14	DELTA FARMS	0	0
15	DELTA FARMS	0	300
16	STELLA	0	20
17	GRAND BAY	0	0
18	EAST BAY	22	35
19	EAST BAY	17	25
20	EAST BAY	3	0
21	MAIN PASS	26	32

Length of perforated intervals treated ranged up to 50 feet. Some treatments used as many as four stages of acid separated by three water gel slugs. Quantities and number of stages were engineered to meet well conditions.



Out of the 21 treatments, 15 showed a definite improvement. The success ratio of 71.5 per cent and the average production increase of 370 per cent were both considered excellent.

As shown above, this water gel, made from water and a Dowell addition agent, is free of solids. It serves well as a temporary plug, yet it thins readily. Viscosity can be tailored to suit well conditions.

When you consider acidizing a long pay section, check with your Dowell representative about water gel slugs. These gels have been used successfully in many areas. Dowell services and products are offered from more than 150 offices and stations in the United States, Canada, Venezuela, Argentina, Germany, France and the Sahara area. Dowell, Tulsa 1, Oklahoma.

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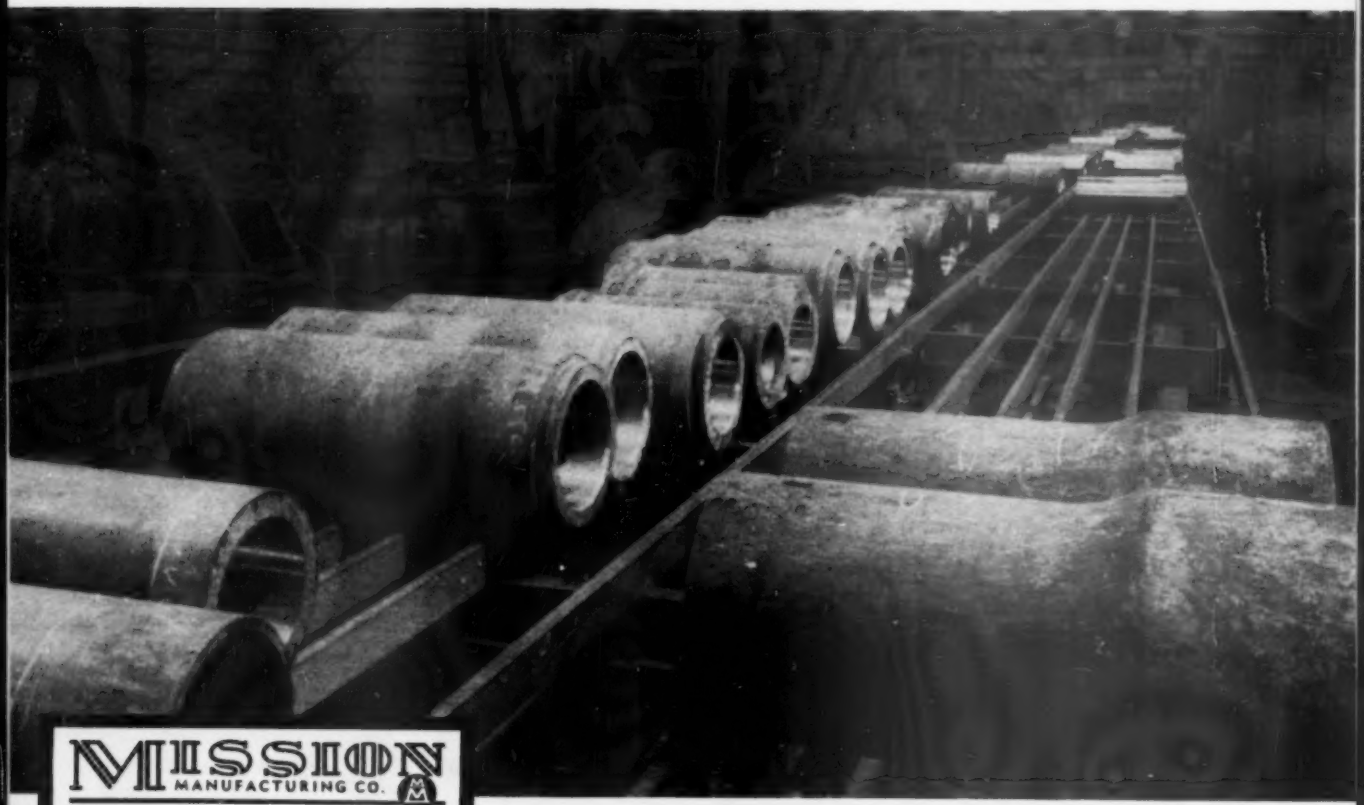

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What's New IN THE INDUSTRY

Standard Oil Co. of California has taken what reportedly amounts to a $70-million plunge into the competitive New Haven and Fairfield County marketing areas of Connecticut. The company has purchased Hoffman Fuel Oil Co., one of the largest marketers of gasoline and oil products in southern New England. Hoffman has 178 service stations and fuel oil distribution plants; it will be operated as a wholly owned affiliate of Stancal.

•

Transcontinental Gas Pipe Line Corp. filed applications this week with the Federal Power Commission to develop the Wharton gas storage field in Potter and Cameron Counties, Pa. The cost: $38-million.

Transco will develop the field jointly with United Natural Gas Co., Oil City, Pa. Total capacity of the new field will be 24-billion cu.ft. of storage, of which 18-billion cu.ft. will be available for Transco to supply gas consumers.

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Du Pont will build a plant at Orange, Tex., to produce high-pressure polyethylene and a new product, "Elvax" vinyl resin, a copolymer of ethylene and vinyl acetate.

The polyethylene unit will bring Du Pont's over-all polyethylene capacity to nearly 400-million lb. The plant is scheduled for completion in the third quarter of 1962.

"Elvax" vinyl resin is designed primarily for use as a wax additive, wax extended polymer, and adhesive base.

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The "community of interest" between coal and oil producers will be stressed by the coal industry's Joseph E. Moody when he addresses the Texas Independent Producers & Royalty Owners Assn. later this month.

The president of the National Coal Policy Conference will participate in a panel discussion entitled "Energy Policy Panorama" at Tipro's 15th annual meeting in Midland.

•

Mason L. Hill has become the 45th president of the American Assn. of Petroleum Geologists. The Richfield Oil Corp. (L.A.) manager of exploration succeeds Ben H. Parker, Frontier Oil Refining Corp., who joins the executive committee as past president. J. Ben Casey, Humble Oil & Refining Co., is new vice-president.

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Kansas' crude allowable for May has been cut to 300,000 b/d. This is 5,000 b/d lower than the April allowable.

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Diversa Inc.'s United Petroleum Gas Co. is expanding its LPG wholesale marketing into central Canada. The Minneapolis firm has signed a 5-year contract with Steelman Gas, Ltd., to market the entire LPG output of Steelman's plant near Domex, Sask. Output is estimated at 12-million gal. a year. Steelman is a subsidiary of Dome Petroleum, Ltd.

United will also obtain at least half of Steelman's 12-million-gal. underground storage capacity near Melville, Sask. United currently operates in Minnesota, Wisconsin, the Dakotas, Arkansas, and Texas.

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R. D. Alden, formerly with Phillips Petroleum Co., and W. J. Sweeney, Esso Research & Engineering Co., will receive API certificates of appreciation May 10 in Houston for long and valued service to API and the oil industry.

The awards will be made at the API Division of Refining's 26th midyear meeting. Both men began their careers in the oil industry more than three decades ago and subsequently advanced to direct the research activities of their companies.

•

The president of Imperial Oil Ltd. last week called for a tightening of the many municipal, provincial, and federal laws affecting the oil and gas industry in Canada.

W. O. Twaits told stockholders of the Jersey Standard subsidiary that the success of Canada's national oil policy depends in great measure on provincial regulations covering production of, and exploration for, crude and natural gas. Incentives for long-term exploration and for the efficient producer depend largely on these regulations, he said.

"It is time," Twaits added, "that conflicts among these jurisdictions be reduced in order to secure the economies of operations which are fundamental to the concept of a national oil policy."

Looking Ahead in Washington

PETROLEUM WEEK

May 5, 1961

A decision is near on a national fuels study, and the Senate will probably create a special committee to undertake the assignment. A last-minute attempt to get the task shifted from a special committee to a standing committee, such as Sen. Clinton P. Anderson's Interior Committee, drew the wrath of coal interests. They pointed out that the New Mexico Democrat's committee is made up entirely of western Senators, and if it made a fuels study, many consuming states and coal mining regions would be denied representation.

•

The membership of a special committee will be up to Vice-President Lyndon B. Johnson, in his role as president of the Senate. On the surface, this looks like a break for the oil industry. However, Washington observers note that the Texas Democrat is concerning himself with issues, both national and international, that divorce him from regional interests. Oil men now fear Johnson might bend over backward in picking the committee to avoid any charges of favoritism to oil, and come up with a committee with less knowledge of oil than some other senator might pick.

Sen. Henry M. Jackson (D., Wash.) is being mentioned as possible chairman of a fuels study group. Based on past performance, the former Democratic National Chairman would be a strong chairman, who would conduct a thorough, objective study. He is regarded, in the fuels field, as a senator without any axes to grind, and without any leaning toward either coal or oil.

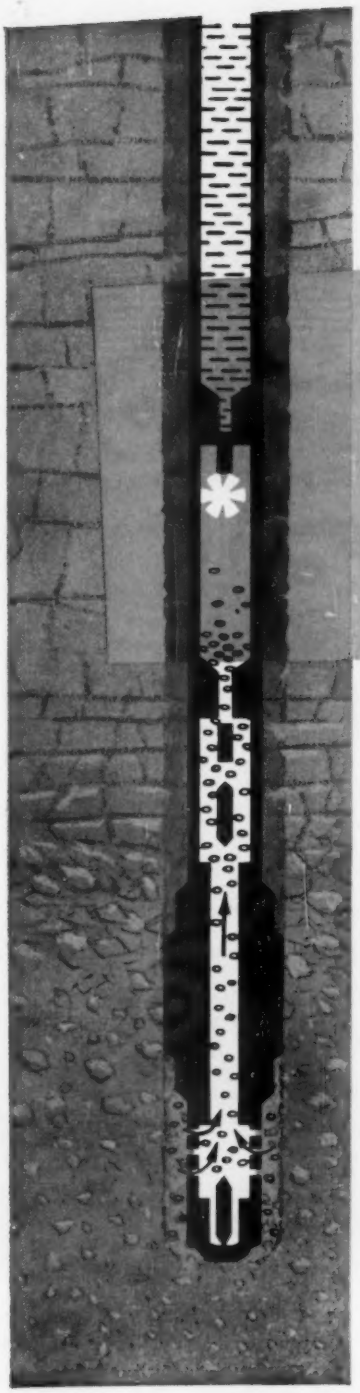
•

Coal will aim for a complete review of the extent to which the U. S. should be dependent on foreign oil. In this, coal hopes for the support of domestic producers. This will be just one coal objective, as both coal and oil attempt to shape the scope of the study in the crucial opening months. The choice of committee staff members will be just as important to both coal and oil as the choice of committee members and a chairman. Such an undertaking as a national fuels study, without very great public appeal, can easily fall under the direction of the committee staff, particularly in the absence of a strong chairman. The staff will guide the gathering and analysis of statistical evidence, and have a big hand in shaping the committee's final report and legislative proposal.

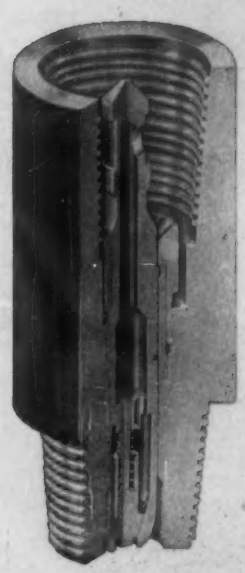
•

Chairman Jerome K. Kuykendall isn't letting criticism of the Federal Power Commission pass unchallenged. Kuykendall, a Republican, is holding the chairmanship against the wishes of the Democratic Administration. After President Kennedy commented on the backlog of some $850-million in undecided pipeline expansion cases, Kuykendall got out an analysis, showing that temporary permits have been issued on $147-million, and giving the status of the rest of the major undecided cases, totaling about $690-million.

Actually, the present backlog of construction permits is much less than usual. The amount now pending compares with almost $1.2-billion a year ago, nearly $1.3-billion two years ago, and an even $1.4-billion three years ago.



now! find low pressure payzones



. . . Regardless of Water Cushion

When testing deep formations, the hydrostatic pressure of the water cushion used to keep the pipe from collapsing can often hide potential production in a *low pressure* zone.

THE NEW HALLIBURTON RETRIEVABLE BACK PRESSURE VALVE can help avoid passing up these payzones by supporting the water cushion so its hydrostatic head does not affect the formation pressure recordings. The Back Pressure Valve is retrievable by wire line.

LOOK AT THESE RESULTS

On a recent West Texas test where the hydrostatic pressure of the water cushion used exceeded 900 psi, the use of the Back Pressure Valve allowed the operator to obtain the following formation pressure recordings from the zone tested:

Initial flow pressure	110 psi
Final flow pressure	303 psi
Closed-in pressure	566 psi

Since all formation pressures were less than the hydrostatic pressure of the water cushion, it is obvious that, without the use of the New Halliburton Back Pressure Valve, no formation pressure would have been indicated and this potentially productive zone might have gone undetected.

ASK YOUR HALLIBURTON TESTER ABOUT THIS NEW INNOVATION!

TESTING SERVICES

Another first in Formation Testing!

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This machine bites clean.

The strength of any tubing joint depends a lot on how tight the joint makes up. The joint must have perfect threads. That's why National Tube has installed this special carbide threading machine to thread oil country tubing (2" to 4½" O.D.). The high-speed carbide tools cut threads that are the cleanest, strongest, most accurate ever produced. So, naturally they make a tighter connection.

National Tube uses two other carbide-tooled machines in this threading line—a profiler that

cleans the cutting surface, and a facer that end-faces, bevels and reams out the pipe. All three machines are linked into one continuous operation to produce perfect threads.

Carbide threading is only one of the many "extras" that National Tube uses to produce high quality seamless oil country tubing. Consider USS National Tubing for your next tubing installation.

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This mark tells you a product is made of modern, dependable Steel.

National Tube Division of United States Steel

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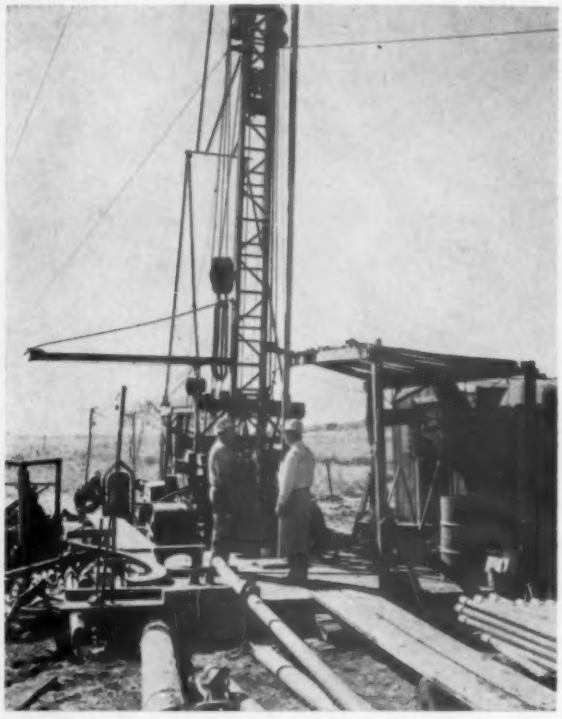
GIN-POLE pulling unit is used to pull this still usable casing from a depleted well before plugging and abandonment.



MODIFIED CABLE TOOL rig is being used on this cleanout of a depleted well prior to its plugging for waterflood purposes.

Old Plugged Wells Pose New Problems

Thousands of barrels of recoverable oil may never be produced because wells improperly plugged 30 or more years ago make secondary recovery too expensive.

The problem is particularly acute in the Mid-continent area, but exists to some extent in all of the nation's older producing regions, where field development and subsequent abandonment preceded the establishment of adequate well-plugging requirements by state regulatory bodies. Most wells involved were drilled around the turn of the century.

One operator observes in reference to a typical Mid-Continent pool: "Most of the wells in this area originally were abandoned during the depression days when salvaged pipe wasn't worth the price of pulling it, and abandonment usually consisted of throwing junk down the hole, then stuffing with burlap sacks and filling with mud.

"The wells were drilled on helter-skelter spacing and no permanent record kept of their locations. During the intervening years, the land has been cultivated, and today no one has any idea where the old wells are until they begin building reservoir pressure through water injection.

"Then wells break out, often in the damndest places. One I know of began flowing oil and water right under the landowner's front porch. Have you ever tried to plug a well under a front porch?"

Cost of re-entering and plugging old wells ranges from $600 to more than $10,000.

One company reported its 1961 budget includes $165,000 for going in and replugging 75 wells on various waterflood projects.

Observes a company spokesman: "Some of the wells we estimate will cost $3,500 may be relatively easy to replug and we may plug four or five in a row for a cost of $1,500 each. Then the next one may be very difficult and cost $10,000.

"In 1959 we spent over $13,000 on one 1,300-ft. well and $5,000 each on several others," the operator says.

Another company reports it has been able to replug some old wells for only $600 using a makeshift rig of its own. The rig consists of a truck-mounted single-pole pulling unit equipped with a 12-in. Brewster rotary table and portable mixing tanks.

The cost of a plugging job with this rig includes $300 for cleanout, $200 for dump-bailer service, and $100 for cement.

A company spokesman says a comparable job done by another concern under contract would cost from $1,200 to $1,500. "Since the entire out-of-pocket cost of our rig was only $7,000, it has paid for itself many times," he adds.

The rig has been used in northeast Oklahoma and North Texas.

Some operators refuse to carry out secondary recovery where replugging costs appear excessive.

One operator reports: "We have turned down several medium-quality waterflood projects simply because of the high cost of properly replugging the old holes. In my opinion, there are many properties that will never be waterflooded for this reason."

Says another company engineer: "Plugging old wells is a definite cost

DUMP-BAILER is run to spot cement prior to well abandonment. Cement is being mixed in hopper on back of truck (left).

factor in all our property evaluation work. I can't say that this cost alone has ever caused us to turn down a lease for secondary recovery purposes, but its inclusion with other acquisition costs could easily have been a decisive factor."

Still another company reports that the cost of plugging old wells can approximate 10% to 15% of original investment costs. "And sometimes," says a spokesman, "this can mean the difference between showing a profit and taking a loss on the entire venture."

Some operators have tried to avoid the high costs of replugging by simply ignoring old holes when instituting waterfloods, but this generally has not been satisfactory.

Reports one observer: "We have noted that our best floods have been ones in which we have replugged the old holes before water injection.

"In some areas (where waterflooding was attempted without replugging) we were forced to go in the old holes anyway because they broke out and ran over water and oil. In other areas, wells did not break out, but neither did our flood perform as well as in portions where old holes had been replugged."

Old wells can occasionally represent a source of secondary income from pipe salvage, but this does not often happen.

"Usually," reports one operator, "about the best you can hope for is some low-grade pipe, and even that is often false economy. If the wells are more than 30 years old, you're usually better off leaving the pipe in the ground."

Most operators feel that replugging costs are needless expenses which could have been avoided by proper plugging at the time of abandonment.

"It is relatively inexpensive to plug a well properly," notes one operator, "if it is done before the casing is pulled, but it can be very difficult and expensive at a later date."

Agrees another company engineer: "In instances where old wells have been temporarily abandoned (no attempt made to plug), or where surface casing remains, we don't have much of a problem.

"Sometimes these old holes can be cleaned out and used for injection purposes. And if not properly located for input wells, $1,000 usually will cover the cost of cleanout and proper cementing.

"It's when we can't find the surface locations that we run into trouble. Then the cost of bulldozing, cleanout, sometimes running pipe, and cementing can add up to $4,000 or $5,000 in a hurry."

The problem of improperly plugged wells appears likely to improve as time goes by.

"Most states now have very good plugging requirements," says one operator. "Only a few remain that are not up to the standards required by the good secondary recovery operator."

Virtually all of today's problem wells are in fields developed in the early 1900s. Older areas in the eastern states also have improperly plugged wells, but better marketing conditions widen the margin between profitable and unprofitable secondary operations. Many of these areas have been profitably waterflooded for years, despite poorly plugged wells.

Wells in such areas as West Texas, just beginning to be ready for secondary recovery operations, were for the most part drilled after state laws were passed requiring adequate well plugging. These areas probably will never present problems with any current form of secondary recovery.

Most fields are now being developed with an eye toward eventual secondary recovery programs. This should help reduce the number of improperly plugged wells.

In many cases, pressure maintenance programs are started soon after pool boundaries are determined.

Observes one company spokesman: "Time was when proper well plugging was looked upon as purely a public relations gesture. You didn't want to get involved in a lawsuit with the landowner, and you didn't want the conservation boys breathing down your neck.

"Nowadays, most companies realize that good plugging is just as necessary a part of oilfield exploitation as is the drilling. Nobody pays more for poorly plugged wells than the oil companies themselves."

This is the fact that has been underscored by the PETROLEUM WEEK survey. And, just as surely, the turn in attitude has come.

MARTIN RUBBER & DUCK RINGS give excellent life in dirty abrasive fluids . . . high or low gravity . . . much or little water . . . shallow or deep wells. They last for years in the easier pumping wells. Replacement rings cost comparatively little.

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Unique Triple Completion Made

Amerada Petroleum Corp. has made a unique salt-water disposal-oil-oil triple completion in Lea County, N. M.

The triple completion, believed to be the first of its kind, was effected at Amerada's No. 13 Wimberly, section 24, 25s-37e, in the Justis pool.

New Mexico's oil conservation commission which approved the completion, believes that while multiple completions incorporating a salt water disposal zone are "inherently dangerous," the mechanics of the completion "appear to afford adequate protection to any fresh waters and all productive formations."

Three sets of tubing were hung from a regular triple tubing head. Salt water disposal is in a formation above the two oil pays.

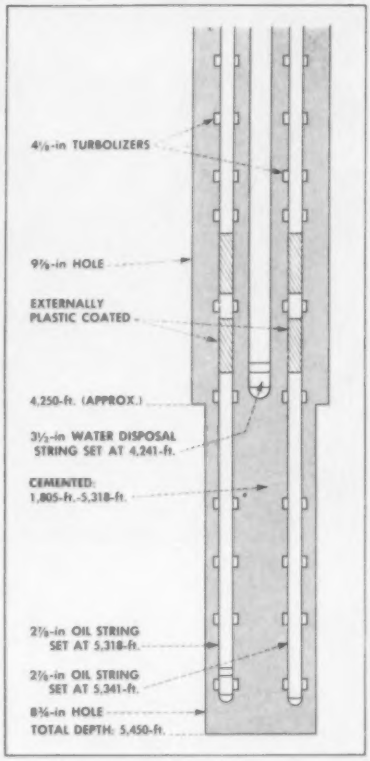
The salt water is being disposed of through perforations at 4,070-090 ft. and at 4,145-65 ft. The water is being injected into the San Andres formation. Injection is through 3½-in. tubing set at 4,241 ft. This string has been internally plastic coated.

A 2⅞-in. tubing string, set at 5,318 ft., was perforated at 5,017-57 ft. for the first oil completion in an undesignated reservoir, possibly upper Blinebry or Paddock. This one tested for 138 b/d of 42.1-gravity oil through 20/64-in. choke.

The second oil completion was made in the Blinebry for 202 b/d of 38.8-gravity oil through 16/64-in. choke and open hole at 5,318-450 ft. The 2⅞-in. tubing was set at 5,341 ft.

In addition to the tubing, Amerada set eight joints of 11¾-in. casing to 855 ft. The hole is cemented from 1,805-5,318 ft.

The three tubing strings are cased from 1,805 ft. to the top of open hole at 5,318 ft.



SCHEMATIC shows how Amerada Petroleum Corp. made salt water disposal-oil-oil triple completion in New Mexico.

The oil producing strings are externally coated with plastic above the salt water injection points.

Amerada engineers conclude that if channeling occurs the water would move upward and corrode the oil strings.

The upper oil string was coated from 3,679-825 ft. and from 3,980-4,164 ft. The lower string is coated from 3,686-835 ft. and 3,989-4,165 ft.

Pennsylvania Play Touched Off

Discovery of a 6-million cf/d gas well has set off a new play in northwest Pennsylvania.

J. Sterling McCluskey et al No. 1 F. W. Brooky, Beaver township, Girard Quadrangle, was recently completed for the 6-million cf/d, open flow, after fracturing.

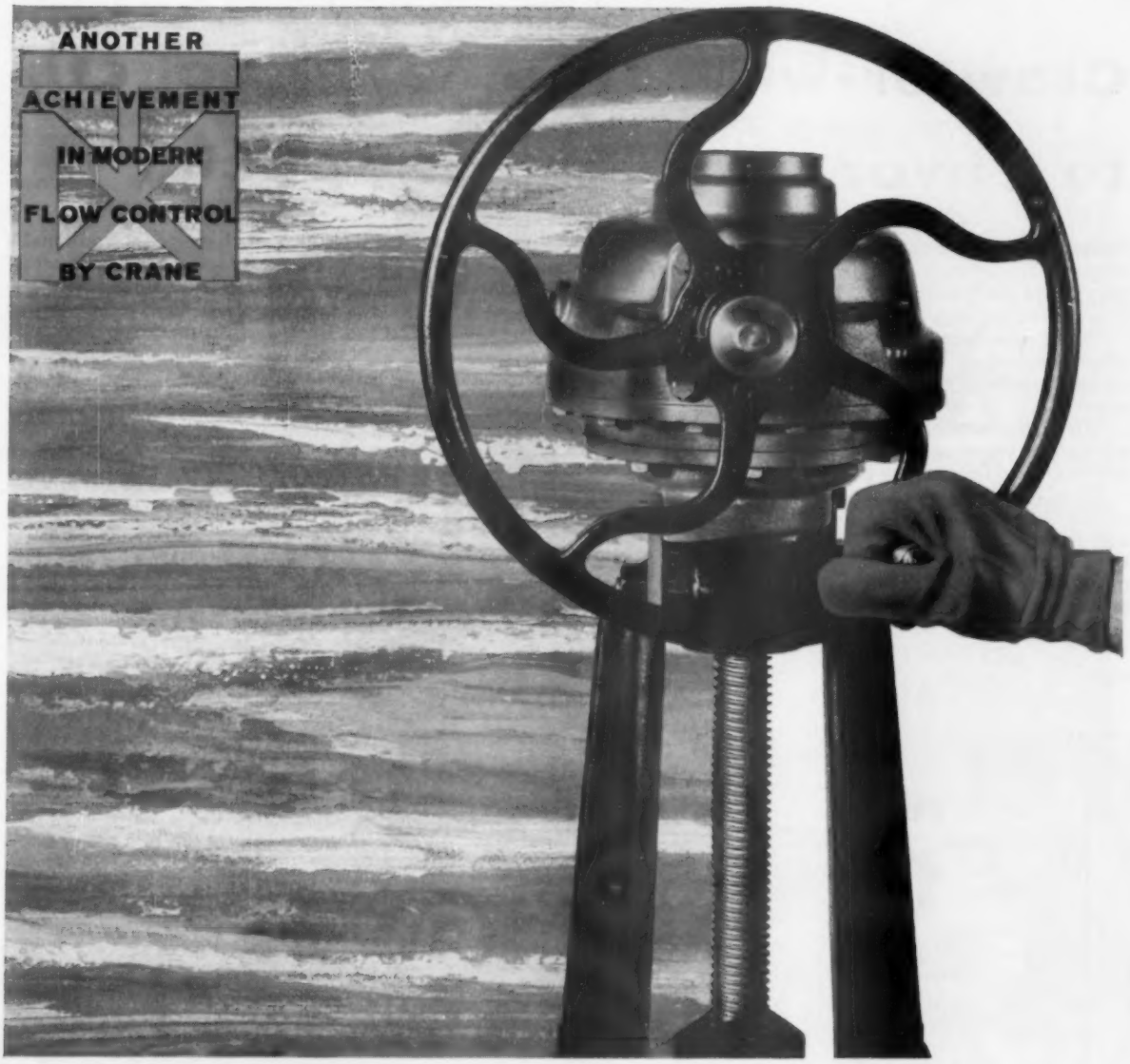
It is said to be the biggest gas producing well ever completed in the area, where completions on the order of 500,000 cf/d of gas are the rule. The discovery is roughly 5 mi. south of a one-well gas producer.

McCluskey drilled the wildcat on a farmout from Benedum-Trees Oil Co.

Four offsets already have been staked and two other wildcats are planned.

Benedum-Trees plans three offsets to the north and northeast of the Brooky discovery.

McCluskey is planning the other 2,500 ft. east. He also intends to drill a wildcat roughly 4 mi. southwest, in Conneaut township, and another some 7 mi. northeast, in Spring township.



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gives you torque enough to tame a torrent. In a matter of minutes, you can power up a wide range of Crane iron and steel gate valves: OS&Y's with ball-bearing or split yokes, rising and non-rising stem types with stems up to 2½-inch diameter.

Take your choice of two styles—horizontal or vertical wheel—both with spiral-cut bevel gears of carburized alloy steel yielding a 4.11 to 1 ratio in manual operation, or with portable air or electric power. Mechanical efficiency is over 95%, with three sets of ball bearings to cut friction, and the entire self-lubricating unit is rugged and weatherproof.

The kit is complete, for simple installation in less than 30 minutes—or your Crane Distributor can take your order now for new valves already fitted with the power-packed Converto-Gear Operator.

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Crawler-wise "skinner" Rockets to Favor with TD-15 "Special"!

When 23-year-old Charles Hailey and Lorin Delap, Stigler, Oklahoma, set up for oil field contracting, they chose an International TD-15 Oil Field Special Crawler—as key equipment.

"I had experience with all the new rigs working for other contractors," states Mr. Hailey. "So when I put up my own money, the International TD-15 was my choice.

"First, in operating a TD-15, I proved it could outwork other crawlers. The TD-15 carries bigger loads, moves around faster, has a good 'dozer and a fast winch.

"The '15' is easiest on the operator which means a lot on 24-hour-day hurry-up jobs. Work quality is also improved—it can make better pits with steeper slopes than any other tractor. This sure makes the drillers happy. The big 6-cylinder engine never runs out of power.

"Second is local distributor service. We never had to wait for expert servicemen or parts on International rigs."

Prove to yourself that the 62-inch-gauge International TD-15 Oil Field Special, with 8-foot outside push-arm hydraulic bulldozer, can work circles around competitive rigs. See how features like the 6-speed full-reverse transmission—"single-stick" shift—Shuttle-Bar control and decelerator—all speed up oil field jobs. Let your International Construction Equipment Distributor demonstrate.

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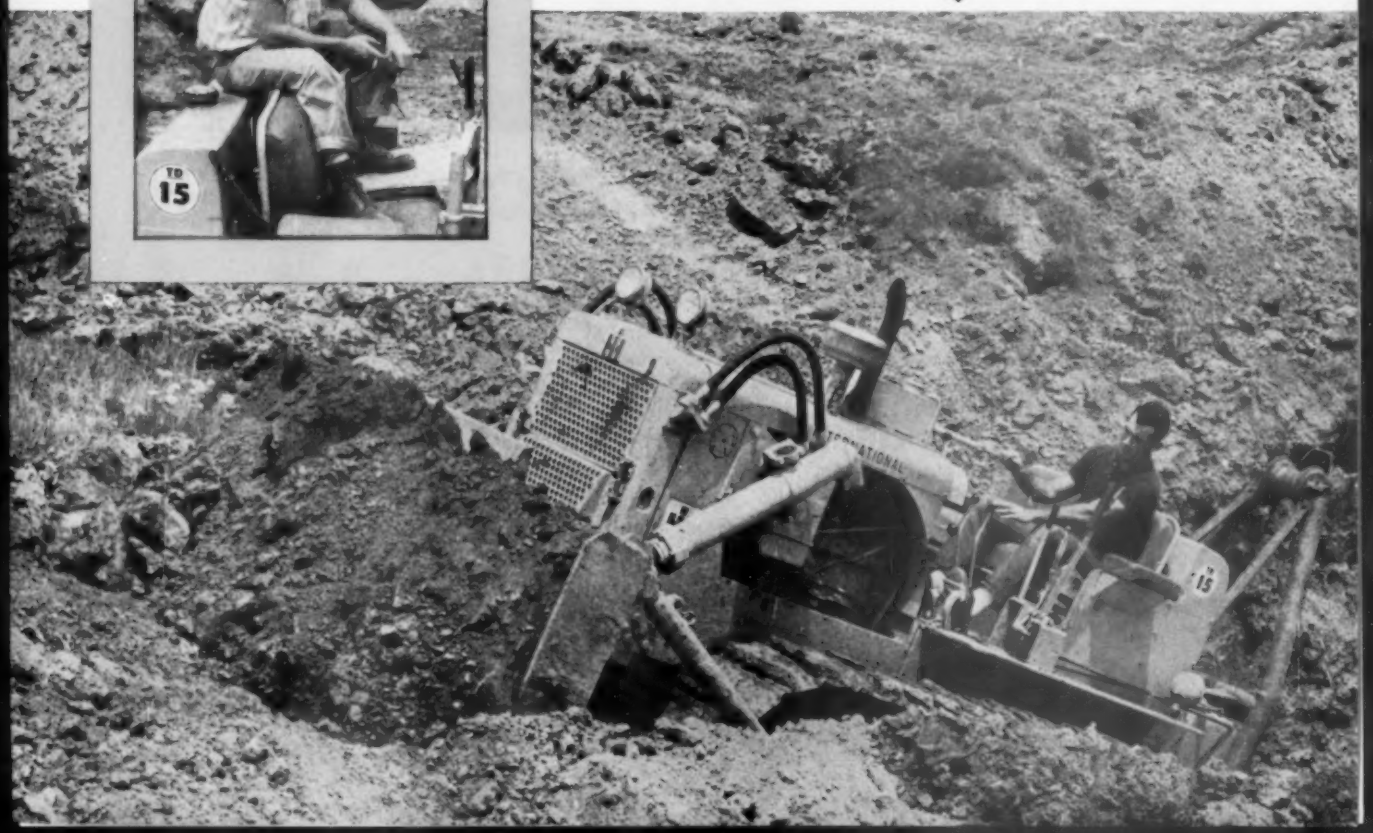
International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

Here's veteran crawler operator Charles Hailey, who "bet" on the TD-15 to make oil field contracting go! "Experts figured my first job would take two dozers 30 hours," states Mr. Hailey. "The TD-15 did it alone with time to spare at about one-third the competitive bid. We have been in demand ever since."

The 105-hp TD-15 owned by Hailey and Delap is shown completing a new drilling location near Stigler. The outfit cleared, leveled, made fills, dug a 200-ft. square reserve pit and two slush pits, and cut a road. The whole job took only 18 hours with the TD-15—which rocketed demand for the new firm's services!



Shell Employs Unique Gas Lift Method

Shell Oil Co. is using chamber (intermittent gas) lift as a means of producing to depletion. A large-scale application is under way in California's Ventura Avenue field.

As deep wells in the area began to decline in production, Shell was faced with choosing a form of lift.

After field tests of various methods, it was found that under the conditions characteristic of the Ventura Avenue area gas-lift would best handle the volumes of fluid the operator wanted to lift. Such volumes ranged from 200 b/d to 300 b/d and in some cases were as high as 400 b/d.

Gas-lift normally has been regarded as a fill-in between flowing and pumping phases, with pumping to be the final method before completion.

But gas-lift, the injection of high-pressure gas into fluid in the well bore to lighten the fluid and help its flow to the surface, posed a problem. The method necessarily applies a certain amount of pressure against the producing zone, holding back some fluid entry into the well bore.

There was a question whether the operator could justify the large expenditure necessary to install gas-lift if it were to be only a temporary expedient, giving way in time to installation of pumping equipment.

Company engineers decided that if gas-lift could cut production costs, then it would be possible to produce a well longer, even with lower output, than if the well were put on the pump.

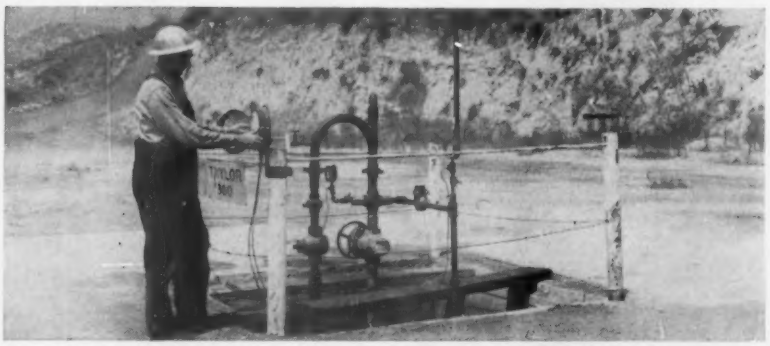
Thus, under certain conditions, an operator could recover as much oil by gas-lift as by pumping, if not more, and gas-lift could logically be considered a production method to completion.

The company is using chamber lift to produce 130 wells in the field because it gives a satisfactory production rate at less cost than continuous gas-lift.

Chamber lift, since it is an intermittent type of gas lift, requires less operating pressure against the formation than continuous gas-lift. The results of initial field testing in 1956 led to today's application.

The chamber lift operates with gas at approximately 1,000 psi. pressure and on an intermittent basis.

Gas is injected into the well's tubing-casing annulus. It passes through an operating gas-lift valve immediately above a packer set at the top of the liner. The gas enters a chamber formed by an outer chamber shell of 2½-in. pipe within which a 1½-in. dip tube has been suspended. The chamber is opposite the liner in the well bore.



GAUGER CHECKS WELL involved in Shell Oil Co. chamber lift program in California.

MANIFOLD (front) meters gas going to wells in Shell's Ventura Ave. field.

The gas forces fluid entering the well bore up the dip tube into the tubing and to the surface, where the gas and oil are separated, with the gas being cycled back to the gas-lift system.

Gas is injected intermittently at 6 to 24 cycles per day depending upon the production rate. An average of 200,000 cf/d is injected.

Gross production at the 130 wells ranges from 25 b/d to 125 b/d, averaging 25% water cut.

Successful application of the chamber lift method depends on such local factors as low productivity indexes, high gas-liquid ratios, and relatively deep wells.

Productivity indexes of wells in the program are low, ranging from 0.01 b/d to 0.10 b/d per psi. drawdown.

Gas-liquid ratios are high, ranging from 2,000 to 10,000, averaging 6,000. A gas-liquid ratio of 2,000 normally is considered high. Such ratios make normal pumping procedures inefficient.

Well depths range from 9,000 ft. to 13,000 ft. The cost of producing such wells when they do not flow satisfactorily increases with depth, with the cost of gas-lift increasing to a lesser extent than the cost of pumping with subsurface hydraulic pumps or beam pumps.

Availability of gas is an important consideration in the application of gas-lift at Ventura.

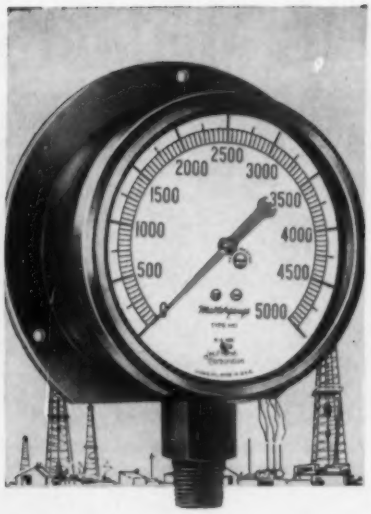
The field's approximately 600 wells produce some 90-million cf/d. Shell gets gas used for its gas-lift work—26-million cf/d for the chamber lift plus an additional 60-million cf/d for continuous gas-lift—from its field production.

The company plans to put additional wells on chamber lift as production declines, and also convert most continuous-lift wells to chamber lift.

When wells drop to about 100 b/d, they will be considered candidates for chamber lift.

Most wells now on continuous gas-lift will eventually be put on chamber lift, according to the company's present plans.

Cost of the changeover runs between $5,000 and $6,000 per well.



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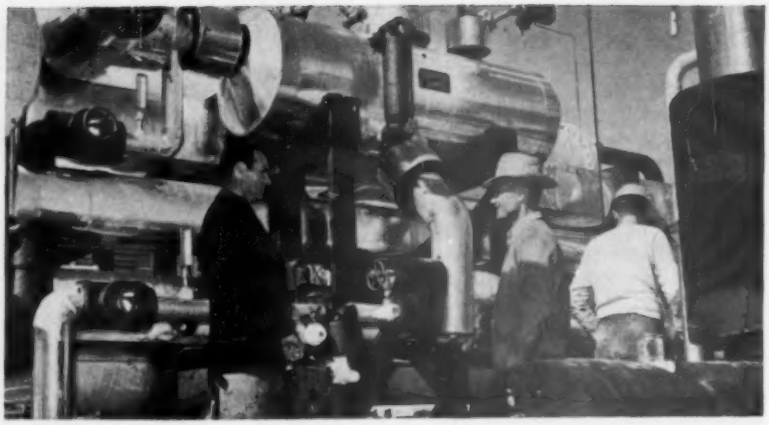


CHILLER UNIT component of Belex system installed in field processing plant.

Refrigeration Aids Gas Processing

One way to compensate for declining input pressure in lease processing of a wet gas stream is to add a refrigeration system, Jones-O'Brien, Inc., of Shreveport has found.

The company is operating such a plant, handling gas from 18 wells in the Bethany-Longstreet field, DeSoto Parish, La.

The facility processes approximately 30-million cf/d of gas, recovering around 2,000 b/d of liquids.

Jones-O'Brien originally built a lease processing plant as a low-temperature extraction system, depending on the expansion method.

Output from the installation includes dehydrated gas that feeds into the Texas Eastern Transmission Corp. line; 8-lb. rich vapor distillate (natural gasoline, kerosine, and the like); and 90-to-125-lb. Reid vapor pressure LPG (butane and propane mixture).

When the plant went into operation in March, 1956, input pressure of the gas stream averaged 2,500 psi.

The stream was choked down, then expanded, to cool it and drop out the liquids.

Declining bottomhole pressure, however, lowered the pressure of the input gas stream and adversely affected the rate of liquids recovery.

The input pressure of the gas stream declined to some 1,750 psi, compared with the original 2,500 psi., an insufficient pressure to effect adequate liquids recovery with the original low temperature extraction method.

The company decided to use refrigeration in order to bring liquids production back to desirable levels.

The operators added a Belex system, manufactured by the J. B. Beaird Co., Shreveport—a mechanical type with 280 tons of refrigerating capacity, utilizing the liquid ammonia evaporaton method.

The unit consists of three skid-mounted main components—cooling tower, chiller unit, and refrigeration compressors (two rotary and two reciprocating).

Temperature of the wet gas stream as it arrives at the plant is around 90F.

The stream first is cooled to 57F in a gas-to-gas heat exchanger by the sales gas leaving the low temperature separator.

With glycol injected as an antifreeze, the stream enters an ammonia evaporator where it is cooled to the desired temperature for liquids extraction.

The Belex system cools it to as low as —10F at full load. At loads less than 25-million cf/d, the system will chill the gas to as low as —20F.

Final separation takes place in a three-phase separator.

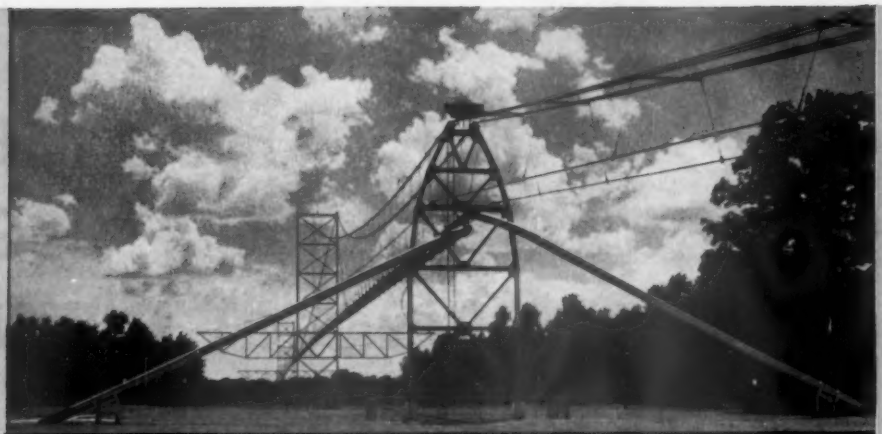
Hydrocarbon vapors enter feedback lines to precool the stream entering the gas-to-gas heat exchanger.

Residue gas then is discharged to the gas line and the LPG is stabilized to a debutanizer, then goes to storage. The refrigeration system, of course, eliminates the original expansion phase—in effect compensating for the pressure decline.

Liquids recovery has increased some 7% for the distillates and 20% for the LPG output. Probable payout time for the new unit is estimated at two years.

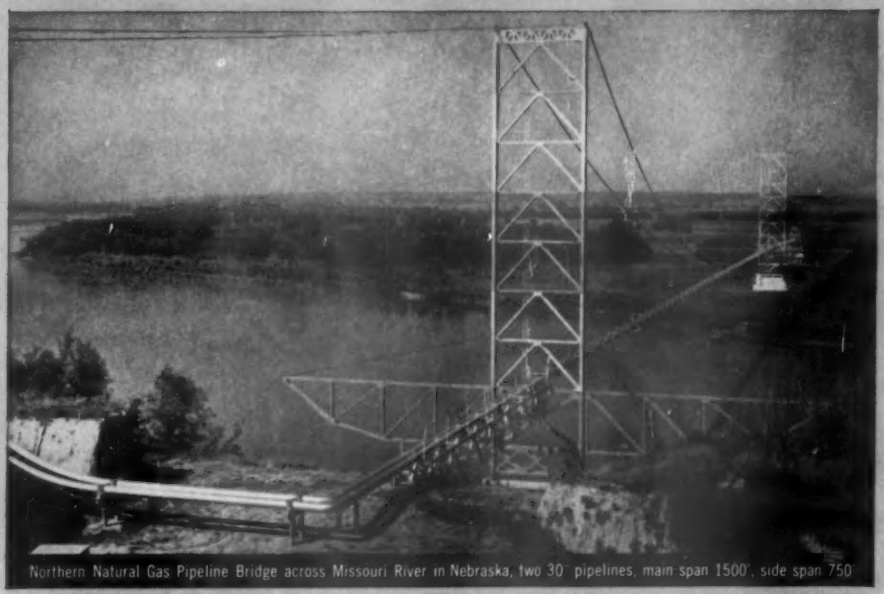
The increase in liquids production, says Jones-O'Brien, "restores the production level to maximum efficiency."

The refrigeration facilities cost approximately $186,205.



United Gas Pipeline Bridge across Red River in Louisiana, two 24" pipelines, main span 1600' and side spans 800'

Prize Winning Symphonies in Steel



Northern Natural Gas Pipeline Bridge across Missouri River in Nebraska, two 30" pipelines, main span 1500', side span 750'

Combining outstanding performance and prize winning appearance are the pipeline bridges PDM built for two of America's leading gas transmission companies. ■ Significantly, the prize for Beauty in Class I of the American Institute of Steel Construction was awarded to PDM for the design and construction of the Northern National Pipeline Bridge. ■ Pittsburgh-Des Moines Steel construction for oil, gas and petrochemical industries, includes pipeline bridges, storage for all purposes and plate fabrication of processing vessels.

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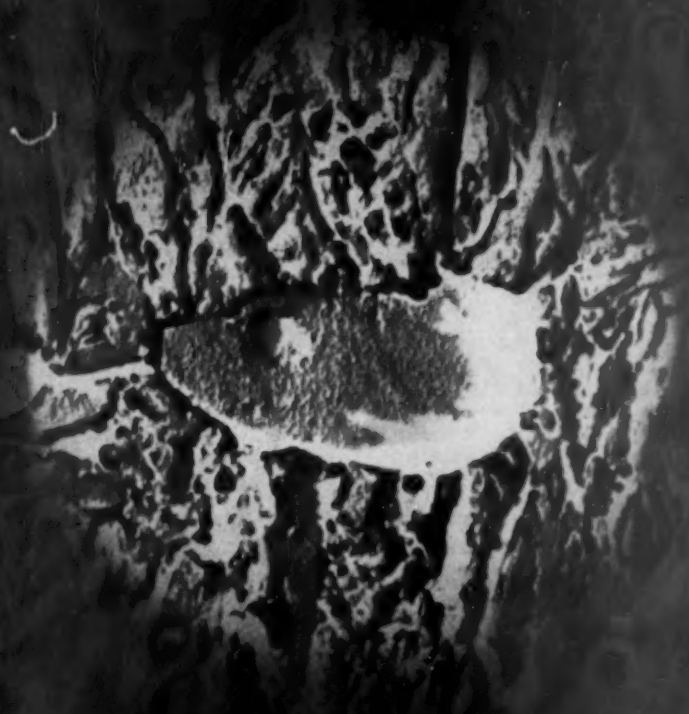
PRODUCING STEEL THAT CUTS IN-THE-HOLE COST OF CASING AND TUBING



Republic looks into the microstructure of steel

To save you money, Republic is working to boost the reliability of pipe, by increasing the fatigue resistance of steel.

Metallurgists are attacking the problem of nonmetallic inclusions in steel, for example, learning how to locate, identify, track, and eliminate them.

Such an inclusion—*magnified more than 33,000 times*—is seen at left as photographed through an electron microscope.

Invisible to the naked eye, this inclusion was removed from surrounding steel by a drill small enough to put two holes, side by side, across the thickness of a human hair. It proved to be a nonmetallic substance of crystalline structure. Recurrence was *eliminated* by a slight variation in the raw material mix.

Republic is minding metal—*ridding steel of inclusions*—to cut in-the-hole cost of casing and tubing. You are assured higher fatigue resistance, higher overall quality, greater protection against costly failures.

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REPUBLIC HAS THE FEEL FOR MODERN STEEL

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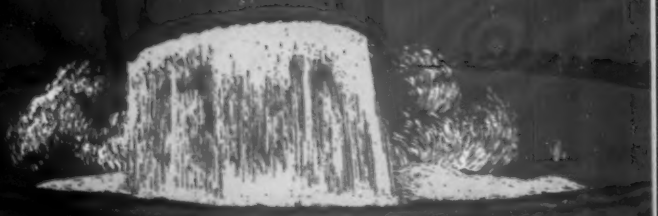
ELECTRIC WELD AND SEAMLESS TUBING: 2⅜", 2⅞", and 3½" O.D. in H-40, J-55, or N-80. ELECTRIC WELD OR SEAMLESS CASING: 4½", 5½", 6⅝", 7", 7⅝", 8⅝", 9⅝", 10¾", and 13⅜" O.D. in H-40, J-55, N-80, or P-110. Buttress Threads available in 5½", 7", 7⅝", and 9⅝" O.D. Contact your Republic representative or write: Republic Steel Corporation, Dept. PW-1834-A, 1441 Republic Building, Cleveland 1, Ohio.

VISQUEEZ slurry shuts off water where all other methods fail!



BJ Service

An exclusive BJ Service development, Visqueez is the most effective method yet devised to shut off water from producing oil or gas wells. Only Visqueez slurry *thins* on contact with water... penetrating and depositing cement deep into the most troublesome water-bearing formations. A special viscous carrying agent puts a protective coating around the cement particles. The slurry cannot set up until a *pre-timed* chemical action removes the oil coating. No high squeeze pressures... no need for reverse circulation or costly drilling out—excess slurry is recovered as free-flowing oil and cement. With BJ Service Visqueez, the well is back on production in 24 hours or less!

For complete details, call your local BJ Service field station today.

Results talk!

Visqueez Increases Oil Production 30%—Decreases Water Production 27%

PROBLEM: To lower the water/oil ratio of the producing wells in a water-flood system in Wyoming. SOLUTION: Visqueez was used to treat 16 producing wells with an aggregate production of 10,883 BWPD and 897 BOPD. Following Visqueez treatments, water production has decreased to 7,983 BPD and oil production has increased to 1,169 BPD. Over-all results: water production down 27%—net oil production *up* 30%.

BJ SERVICE, INC.

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BJ B-W SERVICE

What's New / IN EXPLORATION, DRILLING, PRODUCTION

Geophysical Crew Months Declined Last Year

Geophysical crew months worked decreased 8% in the United States and 18% in Canada last year, compared with 1959.

According to figures compiled by the Society of Exploration Geophysicists, Committee on Geophysical Activity, a total of 5,206 crew months were worked in 1960 in the United States. This is a drop of 490 from the 5,696 total for 1959.

The 1960 total for Canada was 686 crew months, down 18% from the 1959 figure of 841. This followed a 25% reduction from 1958 to 1959.

In the United States, total seismic crews decreased from 5,097 to 4,624 last year; gravity crew months from 612 to 528, and ground magnetic crews from 55 to 53.

In Canada, seismic crew months fell from 796 to 667 last year, gravity crew months from 41 to 19, and magnetic from one to none.

The decline in the United States followed a downward trend that began in 1956, following a peak of 8,240 crew months in 1955.

Licensing, Registration Of Geologists Urged

The president of the American Assn. of Petroleum Geologists recommends that geologists be licensed or registered.

Dr. Ben H. Parker, in his address to the 46th annual convention of AAPG last week, said: "If we fail to do this, others may assume our prerogative and place unreasonable restrictions upon us."

He suggested that perhaps licensing or registration should be limited to "geologists offering services to the public."

He said registration or licensing and a professional organization would respectively assist the geologic profession in community sanction and the acquisition of a professional culture, both of which he defined as necessary to a profession.

•

The Louisiana Mineral Board has accepted bids totaling $15,996,137 for oil and gas leases on 72,856 acres of state-owned onshore and offshore lands.

The highest bid was $2,657,575 for 3,450 acres offshore from Belle Isle Point.

A record in royalty payment was set. J. C. Trahan Drilling Co., Hope Natural Gas Co., and Amerada Petroleum Co. teamed up to bid on a 3.5-acre tract belonging to St. John the Baptist Parish schools. They paid a bonus of $2,398, but the lease agreement also carried a royalty interest of 52% for the schools. State officials say this is the highest royalty agreement they can remember.

•

The demand for energy in the Western states can be expected to continue to increase at its present rate, but whether natural gas will go on supplying its present share of the market depends on finding profitable new fields.

That is the conclusion of Bob Grieder of California Co. in a report to the spring meeting of the Rocky Mountain District, Division of Production, American Petroleum Institute.

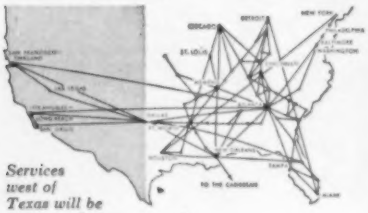
The profitability of the fields will be related to economic exploration

Neither Sand Nor Snow Deter Oil Men in Hunt for Oil

Desert sands and Arctic snow, camels and dogs—all are involved in the search for oil. The "desert" scene (left), however, is not what it seems. The picture was taken in northwest Oklahoma, where Mayflo Oil Co. is drilling in dune country near the Cimarron River, south of Waynoka, Woods County. The area is known, appropriately, as Little Sahara State Recreational Center. The camels and handlers were added to the scene for "atmosphere" by Waynoka citizens.

The dog team (right) is taking a rest break in the Alberta foothills. The Shell Oil Co. crew is conducting gravity readings.

Delta moved directly into the Jet Age with the first Douglas DC-8's and the World Champion Convair 880's. This leadership pays dividends today in superior service and maximum experience on every route operated.



Services west of Texas will be announced soon

DELTA

the air line with the BIG JETS

localizing the most favorable areas, and on reducing drilling and development costs and assuring an adequate price for gas at the well head, Grieder stated.

Though the major supply of natural gas for the Western states has been from the West Texas-New Mexico and Hugoton-Panhandle areas, Grieder predicts that western Wyoming, eastern Utah, and western Colorado will be the more favorable areas for establishing new reserves.

These areas also have the advantage of being closer to the center of demand in Western states.

•

Shell Oil Co. is reported conducting a pilot test in steam heating a shallow zone in the Coalinga (Calif.) field.

The project is in section 29-19s-15e, Fresno County, approximately 1 mi. south of the field's original discovery, a 163-ft. hole completed in 1890.

The operator is not releasing any information on the project, but steam injection is believed to have begun in mid-March.

Seven wells are involved in the steam flood, including one injection well, to producing wells, and four observation wells. The injection well is at the center of a five-spot, with an observation well at each corner. The two producers are each equidistant from the steam injection well, on a northwest-southeast diagonal through the square.

Principal components of the system are a steam generator and water purification system.

The steam generator is a 175-hp. generator with a maximum capacity of 700 psi. pressure. The water system is a deionization system similar to one used by the City of Coalinga, 7-mi. south, to purify brackish water for domestic use.

•

A gas well completion by Atlantic Refining Co. has set two records in Texas, one for deepest production and another for depth of heavy, thick-wall tubing.

The well, Atlantic No. 1 J. C. Kelly, T & P survey, Pecos County, was drilled to 19,696 ft. and is producing through perforations at 15,831-16,680 ft. in a common reservoir in the Devonian, Fusselman, and upper and lower Montoya.

Pure Oil Co. No. 1 Houston Farms Development Co. in Galveston County previously was the deepest producer, at 16,132-16,264 ft.

A total of 15,791 ft. of thickwall tubing, the heaviest ever set, was put into the well. The string consists of 371 joints of 4-in. outside-diameter and 114 joints of 4½-in. OD. Weight of the tubing string is 325,000 lb.

•

Sales of gas and oil leases on allotted Indian lands and state-owned lands brought a total of $118,527 at recent sales.

Receipts for the state-owned land sale were $60,139 for 56 tracts containing 6,839 acres. Sinclair Oil & Gas Co. was high bidder, offering $16,212 for a tract in Beaver County.

In the Indian tract sale, receipts for 33 tracts, comprising 3,228 acres, totaled $58,388.

•

Several operators are contemplating a joint drilling venture in the arctic islands. A decision is expected shortly in the project, estimated to involve $1-million and 100 drilling days.

Two sites are under consideration, one reportedly at Winter Harbor on Melville Island.

It is believed probable that the proposed drilling will take place in 1962, rather than this year.

•

Drilling Highlights

West Texas—Texaco Inc. No. 1 N. B. Birge, section 1, block C-43, public school land survey, Gaines County, was completed for 597 b/d of 42.4-gravity oil and 6 b/d of water through 6/64-in. choke and perforations at 11,069-80 ft. in the Strawn (Pennsylvanian). The discovery is located 1¾ mi. northeast of Champmon pool.

South Louisiana—Union Oil Co. of California No. 2-B LaTerra, section 30-19s-15e, Terrobonne Parish, flowed an unreported amount of gas from several sands. Operator plans to complete in only one, 300-ft. thick, on a choke that will permit a daily flow of around 10-million cf/d of gas through perforations at 14,494-510 ft. The find opens North Pagie Lake field, north of Pagie Lake field, which produces from other sands.

Mississippi—Argo Oil Corp. and Charter Oil Co. No. 1 Berkley-Phillips unit, section 14-10n-2w, Jefferson County, was completed for 182 b/d of 42-gravity oil through perforations at 9,200-05 ft. in the Lower Tuscaloosa. The Gilliam chute pool opener is 6 mi. northwest of Idlewilde pool.

Du Pont *Petroleum Chemicals* News

Number 108 in a series of bulletins for the Petroleum Industry MAY • JUNE 1961

WHAT'S PLAYING AT THE MOVIES TONIGHT?

Chances are, if it hasn't already arrived at your local movie house or drive-in theater, the oil industry's new travel development movie will soon appear in your marketing area.

It's called "Down the Road." It's a full-color, CinemaScope featurette narrated by Lowell Thomas and sponsored by the Du Pont Petroleum Chemicals Division to stimulate American families to greater interest in the grandeur and heritage of this nation. International distribution is being made by 20th Century-Fox.

Highway Adventure

For ten minutes, the screen becomes a thrilling coast-to-coast highway adventure – cruising through the Canadian Rockies, the sands of Daytona, the Painted Desert, a little village in New England . . . visiting great cities like New York and New Orleans . . . watching parades and football games . . . sampling the riches of America's culture and history in a breathtaking series of flashing scenes.

All this is made possible by the family automobile, the magic carpet of the American public. This Du Pont film also includes scenes showing the importance of the service

Continued on next page

A scene from the motion picture, "Down the Road." Film encourages families to visit the scenic and historic beauties of the American continent.

Du Pont RP-2 controls pipeline corrosion for $0.0011 per barrel

Every scraper run through a product pipeline costs you too much.

Every hour lost in pipeline throughput, every filter replacement, every barrel of product made hazy by pipeline rust—*they all cost you too much.*

There is an inexpensive way to cut these losses. As little as 1 to 3 pounds of Du Pont RP-2 corrosion inhibitor, added to every 1,000 barrels of distillate, protects against pipeline rusting.

Example: In a recent test, metal strips were inserted in a pipeline at various intervals up to 750 miles from the refinery. With only 2 pounds of RP-2 per 1,000 barrels of gasoline ($0.0011 per barrel), corrosion control was satisfactory throughout the system. Many of the strips were entirely rust free even after 30 days.

Marketing Advantages, Too

What's more, this is the same RP-2 that (at slightly higher dosages) you can use to add several marketing advantages to your product – anti-stalling, carburetor-cleaning and surface ignition control.

RP-2 is effective in automotive gasolines, fuel and diesel oils, aviation gasolines, jet fuels and other petroleum products subject to pipeline transportation.

Details on this low-cost anti-corrosion protection are available from your Du Pont Petroleum Chemicals representative.

ADVERTISEMENT – Prepared for the Petroleum Chemicals Division of E. I. du Pont de Nemours & Company (Inc.)

OVER ▶

Du Pont *Petroleum Chemicals* News

Continued – Movies

station in keeping the family automobile running properly.

You Can Tie In

If you are interested in tying in your own travel promotion with this 20th Century-Fox film (as many oil companies already have), your Du Pont representative will gladly give you full information on show dates in your market areas.

Prints of a second Du Pont film are available for group showings and for television use. It is called "Highway Holiday", and is also available through your Du Pont Petroleum Chemicals representative.

EASTERN REGION TECHNICAL MANAGER

GEORGE A. FINN is Technical Manager of our Eastern Region, headquartered in New York City.

Dr. Finn has been with Du Pont's Petroleum Chemicals Division since June of 1953. Prior to his present position, he was assistant to the Technical Manager in the Eastern Region. Earlier, he was Manager of our Gulf Coast Laboratory in Houston, Texas.

In the past eight years, he has had extensive experience in working with petroleum products and additives in the division's Gulf Coast and Eastern Laboratories and in the main Petroleum Laboratory located at Carney's Point, N. J.

Currently, Dr. Finn is active in helping a number of refineries and gasoline marketers to evaluate the various antiknocks now available, and to decide which are most economically feasible to provide desired octane numbers. Having experience with all three major antiknocks, TEL, TML and TETRAMIX* antiknock compound, Dr. Finn can give impartial help on all antiknocks.

Dr. Finn is well qualified to help oil refiners. He holds a B. S. degree from Holy Cross, a Ph.D. from Notre Dame, and has considerable practical experience in petroleum technology.

*Trademark

One man can easily carry an armful of lengths of "Delrin" acetal resin pipe. The 2" pipe in 100 mil thickness, weighs only one-half pound to the foot. The pipe comes in 20-foot lengths, can be field-cut easily to special lengths.

New lightweight pipe now helps oil men save money

"What this industry needs," it has been said, "is a corrosion-resistant, lightweight pipe for flow lines, gathering lines, water flood lines and salt water disposal lines."

Pipe dream? It was, until the recent arrival of a new kind of plastic pipe from Du Pont. It's "Delrin" Acetal Resin Pipe, the first and only plastic pipe yet made which can withstand continuous pressure surging, even in the presence of oil.

"Delrin" pipe is unique in that it actually grows stronger, under continuous surging to a peak pressure, than when subjected to the same peak pressure under steady, non-surging conditions.

Corrosion Resistance

This pipe resists corrosion, of course – inside and out. It is strong in the presence of oil even at high temperatures. It is tough. It resists solvents. It resists weather and withstands underground burial.

Even sour crude oil and salt water have no corrosive effect on "Delrin" pipe.

Yet, it is lightweight and can be quickly installed in the field. Integral joints are made by a simple heat-fusion process, taking only about 25 seconds to complete – and the pipe can be operated at full pressure immediately afterward!

Other Savings

Shipping, storage and handling of "Delrin" pipe mean savings for you. Extensive test installations at eight leading oil companies have helped to prove out these advantages. Results of those tests led to the recent commercial introduction of this pipe by the Du Pont Company.

If you would like further information on the economies of "Delrin" acetal resin pipe, please write to: Du Pont, Polychemicals Department, Wilmington 98, Delaware.

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. . . *through Chemistry*

Du Pont Lead Antiknock Compounds and other Petroleum Additives

OVER

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Printed in U.S.A.

AT HUMBLE'S BAYWAY REFINERY . . . IN OIL FIELDS AND PROCESSING PLANTS

At Bayway Refinery, a workman removes 2" studs from a cracking unit preheater exchanger that has been exposed to 1000°F. temperatures for prolonged periods. On another job, the time required to remove twenty-two yoke and gear bolts from a Chapman gate type valve was reduced from 8 hours for two men to 1½ hours for one man.

Above, blowout preventer covers are tightened to the prescribed pressure with a 1" square drive SWENCH. Because of its precise torsional impact, the SWENCH can be used for precise tightening as well as loosening jobs. SWENCH can be effectively used for many tough jobs in isolated and hard-to-reach places.

FAST, SAFE, LOOSENING OF "FROZEN" BOLTS AND NUTS . . . ACCURATE TIGHTENING . . .

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TYPICAL USES . . .

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Pumps **Flanges**
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Blowout Preventers
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At Humble's Bay Way Refinery, bolts and nuts "frozen" by heavy coking, prolonged exposure to high temperatures and corrosion are quickly, safely and economically loosened with a SWENCH wrench . . . more oil fields and processing plants are using SWENCH daily for makeup, teardown and maintenance jobs. The portable SWENCH, with its tremendous built-in torsional impact power, is daily replacing hand wrenches with cheater bars, sledges and power impact wrenches, because a SWENCH does many jobs better, faster and more economically. A SWENCH wrench has the power to tackle the toughest bolt and nut loosening jobs — yet is precise enough for the most accurate tightening. A SWENCH requires no outside power source or connection — can be taken anywhere . . . used anywhere by one man. SWENCH has the power to do the best job — save valuable man hours. Available in sizes from ½" square drive to 1½" square drive delivering from 250 to 7,000 ft.-lbs. of torque. Ask your local distributor for a demonstration today, or write:

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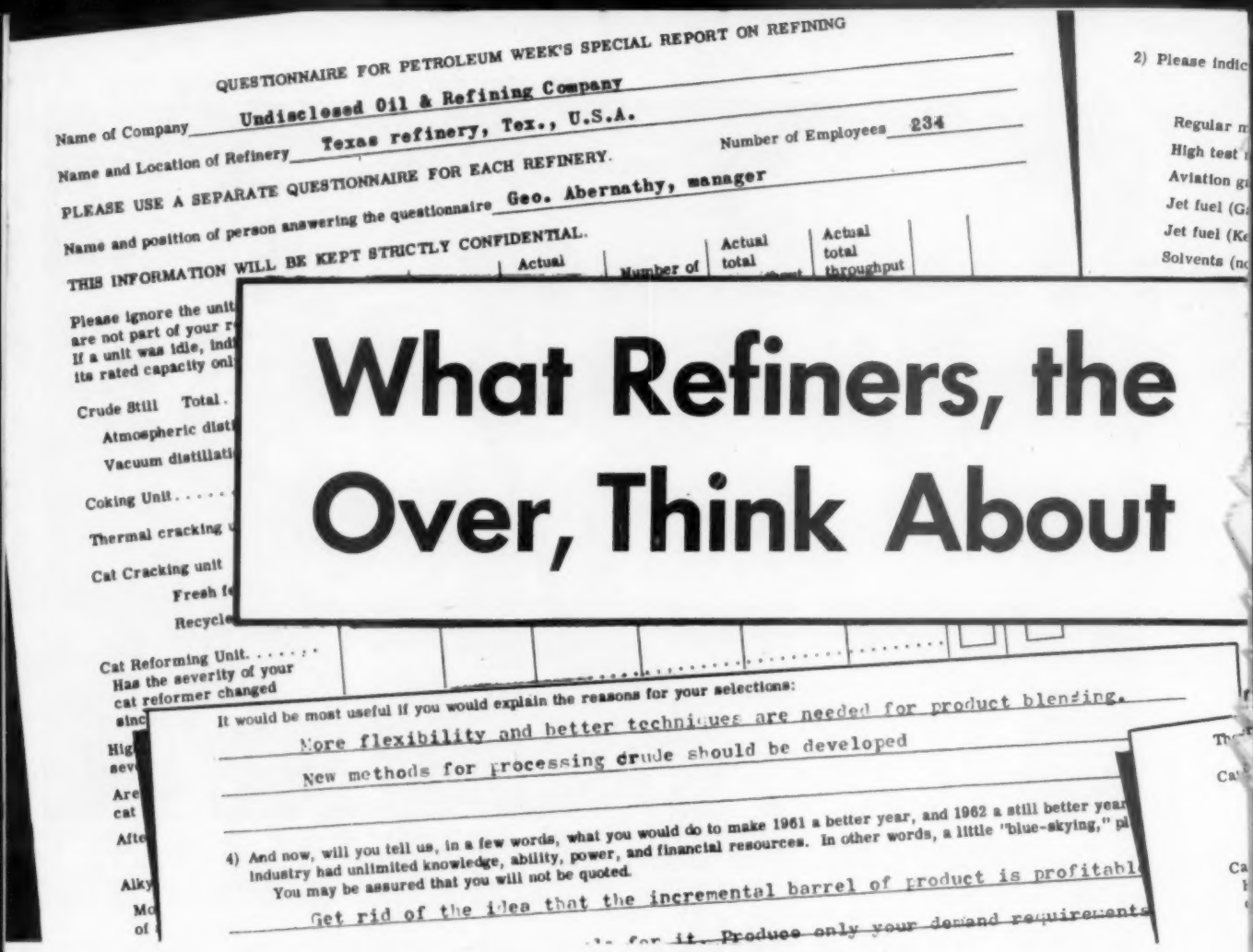
QUESTIONNAIRE FOR PETROLEUM WEEK'S SPECIAL REPORT ON REFINING

Name of Company Undisclosed Oil & Refining Company

Name and Location of Refinery Texas refinery, Tex., U.S.A. Number of Employees 234

PLEASE USE A SEPARATE QUESTIONNAIRE FOR EACH REFINERY.

Name and position of person answering the questionnaire Geo. Abernathy, manager

THIS INFORMATION WILL BE KEPT STRICTLY CONFIDENTIAL.

Actual | Number of | Actual total | Actual total throughput

Please ignore the unit
are not part of your r
If a unit was idle, indi
its rated capacity onl

Crude Still Total .
Atmospheric disti
Vacuum distillati
Coking Unit . . . . .
Thermal cracking
Cat Cracking unit
Fresh fe
Recycle
Cat Reforming Unit. . . . . .
Has the severity of your cat reformer changed sinc
Hig
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cat
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of

It would be most useful if you would explain the reasons for your selections:

More flexibility and better techniques are needed for product blending.

New methods for processing crude should be developed

4) And now, will you tell us, in a few words, what you would do to make 1961 a better year, and 1962 a still better year
industry had unlimited knowledge, ability, power, and financial resources. In other words, a little "blue-skying," pl
You may be assured that you will not be quoted.

Get rid of the idea that the incremental barrel of product is profitabl

for it. Produce only your demand requirements

2) Please indic
Regular m
High test
Aviation g
Jet fuel (G
Jet fuel (K
Solvents (n

What Refiners, the Over, Think About

Refinery progress in the '60s will hinge on better planning of refinery runs, and new technology, long overdue, to upgrade more of the crude at less cost.

Cautious optimism is the keynote among refiners today. They no longer reflect the gloom that has hovered over the industry for the past two years. This is a key conclusion from a PETROLEUM WEEK survey of refiners all over the world, which has just been completed.

Almost all refiners who replied to the questionnaire show definite signs of optimism. And if that optimism is —in the words of a spokesman for one of the major oil companies—"cautious," it is also "active." Refiners realize that certain things ought to be done, and they show themselves prepared to do them.

Overcapacity is still high, but it appears to be on the decline. And few refiners seem to be much worried.

One opinion about overcapacity was given by the senior vice-president of a major oil company in the West. "I believe it unfortunate," he wrote, "that some parts of our industry have elected to point out excess capacity as being the cause of the industry's problems. The refining segment of the oil industry should expect to have excess capacity to the same extent that we have excess capacity in other phases of the industry—production, say, or marketing. We should never expect that for any period of time physical refinery capacity is going to determine the extent of refinery runs. If that condition were ever reached, refiners would be obligated to immediately provide additional capacity."

On the other hand, the spokesman for a major company in the East has this to say about overcapacity: "Past published estimates of long-range demand for petroleum products in the U.S. have shown a tendency to overestimate; and it is on such forecasts that planning for further construction has been based. Crude runs since 1956 have not paralleled this expected growth, for several reasons:

- "The refining industry has increased the yield of clean products obtainable from crude;
- "Natural gas liquids are increasingly contributing to the availability of clean products;
- "Exports of products have gone down;
- "Imports of clean products (gasolines and distillates) have gone up—although this increase has now stopped.

"As a result," he says, "while the demand for clean products has increased by nearly 1-million b/d between

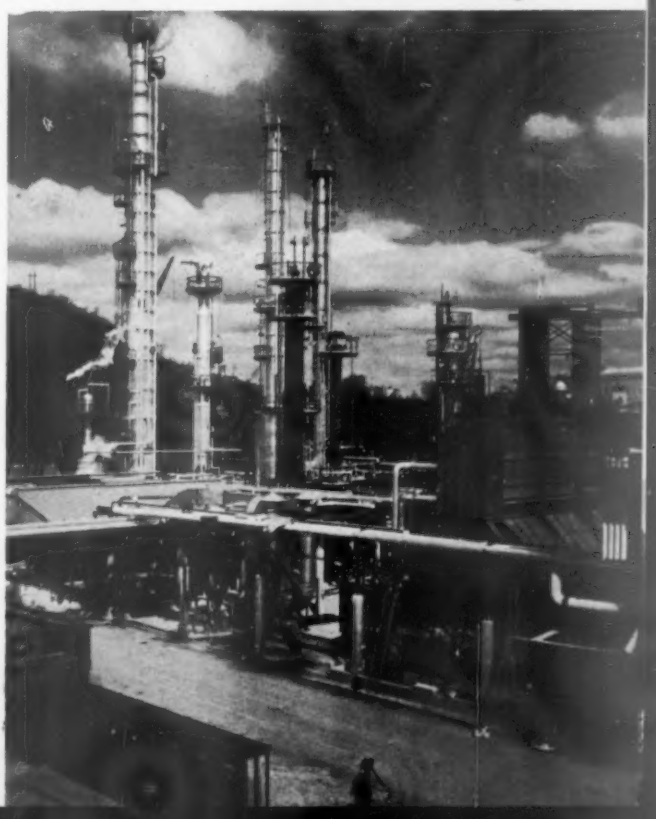
World Refining

SPECIAL REPORT
REFINING

Is refinery overcapacity as serious a problem as it's cracked up to be? Is over-production of petroleum products general all over the world? Is refining technology advancing as fast today as it should be? In what areas is the industry most in need of a technological breakthrough?

These are among the questions to which refiners themselves would most like to get the answers — as determined by PETROLEUM WEEK discussions with a large number of refinery executives. To get the answers, PETROLEUM WEEK sent a comprehensive questionnaire to some 400 refiners, major and independent, in the U.S. and abroad. More than half of the questionnaires were filled out and returned.

The accompanying Special Report presents the conclusions from this survey.



NAPHTHALENE AND BENZENE are made in a new Hydeal unit at Catlettsburg, Ky., as Ashland Oil & Refining Co. pushes forward its petrochemical expansion.

1956 and 1960, the crude runs in the same period have only increased by 130,000 b/d. This has contributed to the present situation, in which there is more than ample capacity to meet the current level of demand. Because of the same reasons, crude runs are expected to increase only slightly."

In 1960, refiners in the U.S. operated as an average at 82.9% of their total crude capacity, according to PETROLEUM WEEK's survey.

But these signs are of interest: Over 62% of the refiners in the survey had increased their throughput from 1958 to 1960—40% very substantially—while only 21% of the refiners had decreased their throughput.

In many cases, crude throughput had been curtailed not for economic reasons, but because of some limiting factor in the operation of the refinery itself.

In some cases, the limiting factor was the cat reformer; in other cases, the unit for the final treatment of gasolines and distillates.

continued ▶

PETROCHEMICAL PLANT of Mobil Chemical Co., Beaumont, Tex., will go on stream this summer. It will first make polyolefins and aromatics.

SPECIAL REPORT
REFINING

Better Planning Needed

Overproduction, and the chaos it causes on the market, is considered a much more serious menace to sane refining operations. Most refiners feel that a better control of refinery runs, more in line with market demand, is essential to bring back to refiners the profit incentive they may expect from more realistic prices.

Nearly all U.S. refiners had something to say about overproduction, depressed prices for refinery products, price wars, and "unfair competition," all brought about by striving for "the incremental barrel." Here is how some of them express it:

From Louisiana: "The key to better years ahead is to reduce surplus inventories of refined products, and maintain refinery runs at levels commensurate with demand."

From Kansas: "We must realize that we are primarily a manufacturing industry, and not merely a vehicle to move crude oil," says Vickers Petroleum Co.'s vice-president W. K. Jackson. Also: "We should get rid of the idea that the incremental barrel of product is profitable, if there is no sale for it," according to Richard Kersey, of Derby Refining Co.

From Texas: "Crude runs should be held down to reasonable levels, and gasoline price wars that result from overproduction should be eliminated."

To accomplish this, refiners must first acquire a better understanding of their market, so that they may tailor their production to temporary, as well as to more permanent, changes in demand.

"We should keep supply and demand in balance by a judicious control of refinery runs and operations," says the vice-president of a major company in the South. And a Southern independent says: "Refiners should make every effort to regulate refinery production in strict accordance with market demand."

A better study of the market may lead to substantial changes in the relative proportions of finished products manufactured in U.S. refineries.

Refiners usually tend to maximize the production of gasoline, because of its greater rate of return to the manufacturer. But it is now generally felt that this practice has been carried to excess.

The returns of the survey indicate the following average U.S. refinery yields for 1960: Gasolines (including motor gas, high-test, and aviation), 47.4%; distillates (including solvents, kerosine, diesel fuel, jet fuel, and heating oils), 31.6%; residual oils and asphalts, 11.4%; and miscellaneous (LPG, lubes, wax, coke, etc.), 9.6%.

A very similar distribution was indicated by the returns from Canadian refineries.

Long-range planning, based on more realistic market surveys, is only part of the effort that will be required to help refiners out of their present state of frustration. For one thing, more promotional work is essential, according to more than 33% of the refiners who replied to the survey.

Their feeling is summarized by D. E. Farnsworth, president of Eddy Refinery Co., Houston: "A sincere effort to increase the over-all use of petroleum products should be accomplished, to make full use of the available refining capacity in existence in the country."

"Improvement in 1961 and 1962," one of the majors points out, "would depend mostly on successful market development, and this is where most of the effort should be spent."

And an executive of one refinery, which is operating at a fraction of its full capacity, feels that, "More ballyhoo would certainly not damage the cause of our industry. Forces should be marshalled to broadcast our industry to all motorists and to all prospective customers."

New Uses Are Sought

Likewise, more research work, to find new applications for petroleum products, should be actively undertaken.

"We must strive to create new markets for petroleum products," writes the senior vice-president of a large midwestern company. "The expansion of markets must be explored before any decision of process development can take place. Let us get more practical research programs under way."

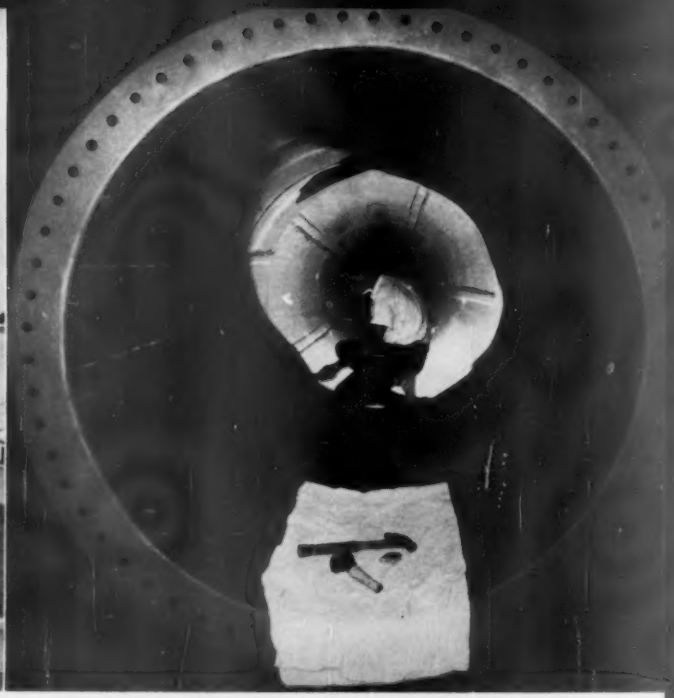
And from the East comes this advice: "The industry should recognize that the market for petroleum products has limits; it must produce and refine within these limits. As a corollary, the industry should bend every effort toward developing new uses for petroleum products in order to move these limitations further."

One of the most rewarding searches for new uses of petroleum products seems to be in petrochemicals.

According to the survey, less than 2% of the total yield of refineries today goes to petrochemical production.

continued ▸

165,000 gallon capacity cargo tank being lowered into saddles in petrochemical barge hull. Lifting device (partly shown) has 600 ton capacity.



Rubber lining being applied to unit of a chlorine system. Flow meters, valves and tanks are lined with speed and efficiency. Avondale is the authorized U.S. Rubber Co. applicator for N.W. Fla., Ala., Miss., S.W. Tenn., Ark., and La.

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Shown here are the basic UOP activities serving the petroleum industry. UOP will be happy to provide more detailed information on any UOP process, service or product.

PETROLEUM REFINING AND PETROCHEMICAL PROCESSES . . . in all UOP offers 23 processes for the production of the full range of petroleum products.

MARKET RESEARCH SERVICE . . . includes evaluation of markets and potentials, geographic factors, marketing trends, personnel requirements, and process application planning.

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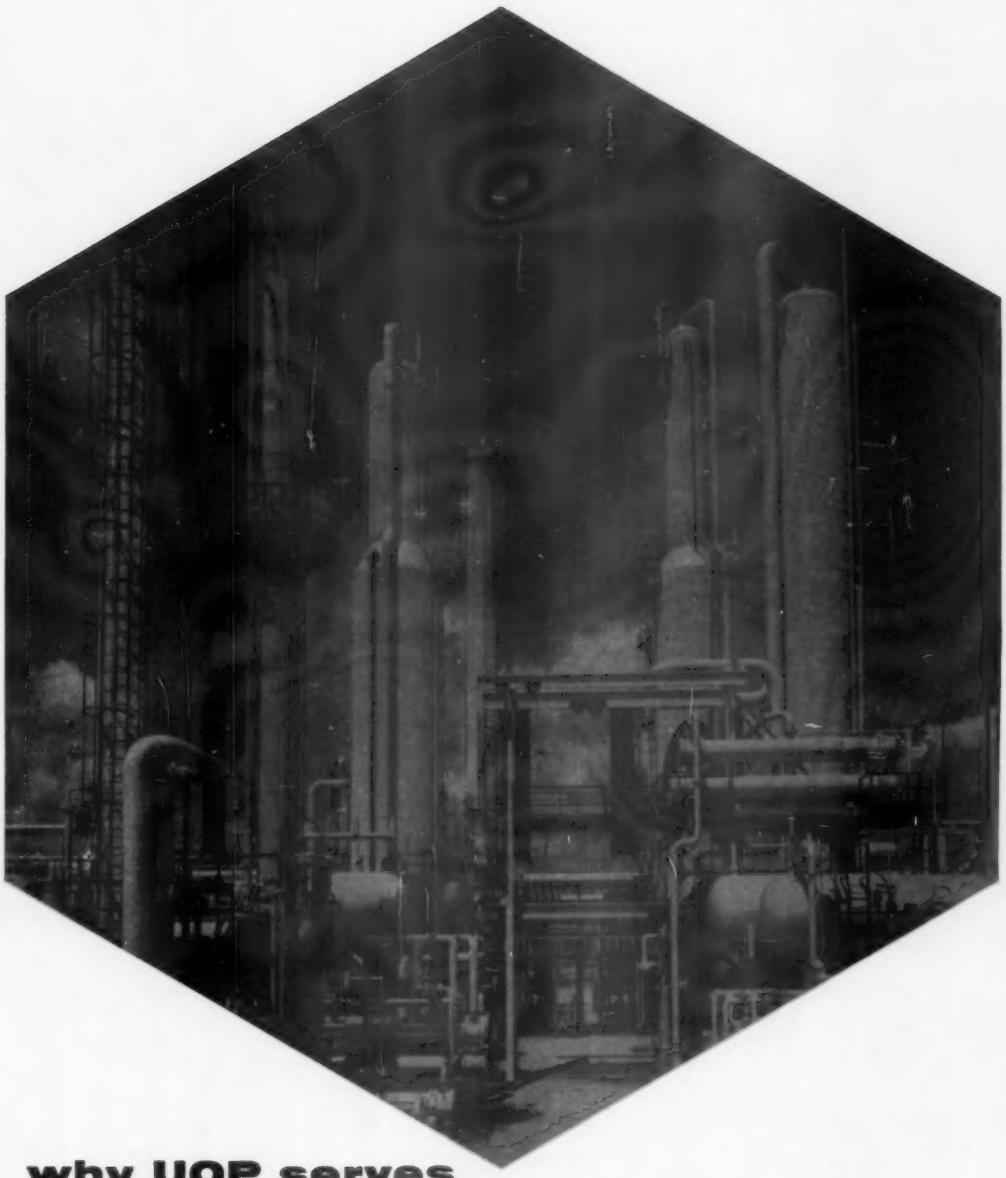
REFINERY STAFF INSTRUCTION . . . UOP provides expert staff instruction in training refiner's process operators in conjunction with the installation of UOP process units.

UOP PRODUCTS . . . UOP catalysts, developed and manufactured to exacting specifications of purity and high activity, assure efficient processing. In addition UOP offers a wide range of inhibitors and antioxidants for maintaining the quality of petroleum products. These additives enable refiners to solve such problems as product contamination, stability, color, viscosity, gum formation, and maintenance of octane values.



why UOP serves the petroleum industry so well

The fullest measure of service to the petroleum refining industry has been and will continue to be UOP's purpose. Starting with the research and design of petroleum refining and petrochemical processes, through the field and laboratory services performed in conjunction with these processes, UOP has directed its capacity to provide a wide variety of elements needed to aid the refiner in producing and marketing the best quality petroleum products.

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Up to nine grades of gasoline . . . from the same nozzle . . . merely by turning a selector knob. And it is accomplished with just two products—regular and super high octane. This is the Wayne Blender, the only pump that meets the exact fuel requirement of every car on the road today or in the foreseeable future.

Yet the real story of the Blender is not its ingenious design. Rather it is the profit potential it offers you—both at the island and through savings in refining costs.

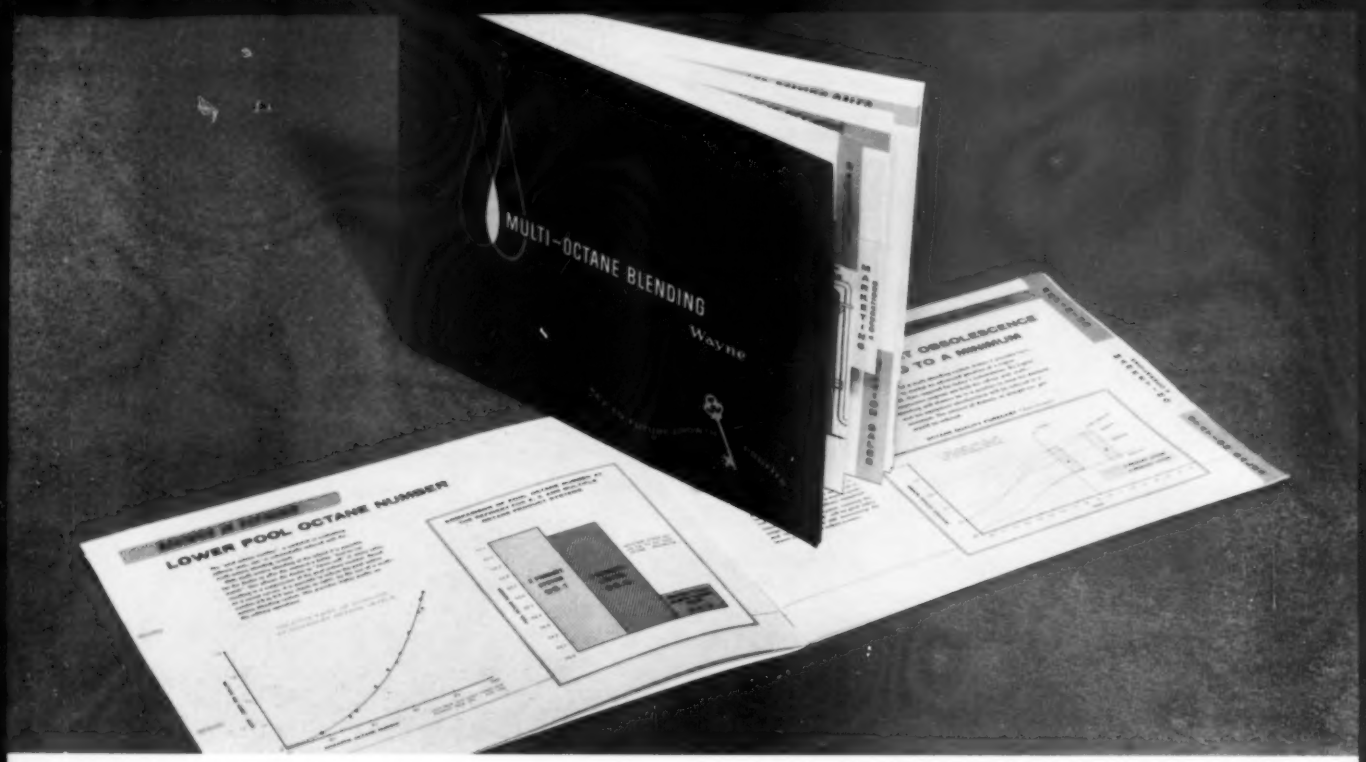
The Wayne Blender, for example, gives you not one or two, but *eight* opportunities to trade up . . . vital at a time when many motorists are retreating to regular. Also there are the

compacts, many of which actually need a slightly upgraded fuel, though not a full premium. In both situations, you have a customer who balks at 5¢ extra but will usually go a penny or two more (grades 2 or 3 on the Blender) to get the improved performance possible. *These pennies count, for while the bulk of your sales are in regular, your profit lies in the premium grades.*

Then there are savings in refining costs—particularly through reduction of pool octane number. One major refiner reports a P.O.N. reduction of 0.9 following his change to blending. The resultant saving: Over $80,000 per million barrel run.

What is the overall experience of refiners who have adopted blending? They report an average increase of over 10% in sales since making the changeover. And they attribute the increase directly to blending.

This evidence, we believe, confirms the original predictions made for blending—that *ultimately blending at the point of sale will be accepted by refiners as the only profitable way to sell gasoline and by the public as the only sensible way to buy it.* If you would like more information on the Wayne Blender, more facts and figures on its marketing implications, send for the booklet shown on the next page.



More information on the Wayne Blender and its profit potential for you

With today's diversified car population, many refiners have already gone to three products in an effort to hold their total market. And the trend is for the octane spread to continue to widen, bringing pressure for costly 4- or even 5-product systems.

The Wayne Blender—the most significant pump innovation in a decade—was developed specifically to solve this problem. It is a highly sophisticated dispenser, yes. But far more important, it is a marketing tool—the basic tool in a new method of selling gasoline. For more information on blending as a new marketing concept—and on the competitive advantages and operating economies it offers—request a copy of the Wayne booklet "Multi-Octane Blending," shown here. Write W. C. Leitch, Vice President, The Wayne Pump Co., Salisbury, Md.

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Some refiners supply for further chemical conversion from 6% to 10% of their production. But hundreds of refiners do not, at present, contribute at all to the chemical industry. And many indicate that their petrochemical contribution amounts to only a fraction of 1%.

But a significant number of refiners say that their production of petrochemical raw materials is scheduled for an increase this year or in 1962.

Other new applications for petroleum products may be developed in metallurgy, in atomic energy, and as fuels for space travel.

Most advanced among these developments is the application of oil for the firing of blast furnaces; the process has now passed the pilot-plant stage, and is being tried commercially (PW—Apr.21'61,p90).

Many of the refiners who participated in the survey have U.S. government contracts for the development of fuels and lubricants suitable for space travel and for rocketry, as well as for nuclear energy research.

It has often been suggested that the removal, or relaxation, of government regulations would be very beneficial. Several refiners answered the PETROLEUM WEEK survey by suggesting that government regulations are the source of all the trouble in refineries today. "Remove unnecessary government regulations," says an Eastern refiner. "Do everything possible to prevent federal control, by being more active in politics," comes from the Middle West.

Some refiners mentioned specifically federal control of gas prices, and the influence that this control has on the market for fuel oil. As a spokesman for one of the major oil companies puts it: "The trouble with the oil industry . . . is the gas industry."

One Texas refiner suggested that the price of natural gas be allowed to become equivalent to that of crude oil on a Btu. basis. "This," he said, "would make the price of natural gas nearly four times as high as it is now. It would substantially help refiners."

But an increasing number of refiners feel that such suggestions are not very realistic.

"I am convinced that we can expect ever increasing governmental regulation in our lives," J. O. Grantham, vice-president of Northern Natural Gas Co., told the recent meeting of the Western Petroleum Refiners Assn., in San Antonio. "People in their panic and frustration," he explained, "are quite likely to clamor for and receive increasing government regulation."

New Technology Long Overdue

There have been few significant changes in basic refinery processing units in the past few years, and refiners, in increasing numbers, feel that new technical developments are due.

"Every few years," says a spokesman for a top refinery engineering firm, "some basic development that can be considered as a breakthrough has taken place: In the early '30s it was the concept of the 'integrated refinery.' In the early '40s it was fluid cat cracking."

"Refiners feel that a breakthrough is way overdue," says another refinery engineering executive. "Yet no one knows exactly in what area of refining it will appear."

There is considerable speculation about who might originate the next technological breakthrough: Will it come from within a refinery, from an engineering firm, or from abroad?

ONE WAY TO UPGRADE the bottom of the barrel: Mobil Oil Co.'s Paulsboro (N.J.) coker treats 20,000 b/d of residue.

Research and development activity, in many refineries, has suffered from cost-cutting in the past three years. As a result, some believe that a purchase of ready-made intelligence, in the form of a license, can be substituted for self-developed know-how. Such a practice, if generally applied, can only result in continued losses in the industry, according to the spokesman for a major refiner with international operations. "Oil companies must stand on their own feet," he said. "If they put only money and not know-how into the business, they can only expect a banker's return."

Refiners look at the rapid progress of their petrochemical industry, and wonder why so little progress, by comparison, is taking place in oil refineries.

Why, they ask, does each new polyolefin unit show a substantial improvement over the last polyolefin unit constructed—even a few months before—whereas so little improvement can be found in today's cat cracking unit, as compared with a 1958 version?

Improvements in cracking and reforming units are most needed, according to some 25% of the refiners in the survey. These betterments, they indicate, should come in the way of new techniques, and more efficient design of the units, as well as in better construction materials for longer trouble-free periods between turnarounds.

More flexibility is considered desirable, to be able to make more of the particular products needed, when they are needed, according to 30% of the refiners surveyed.

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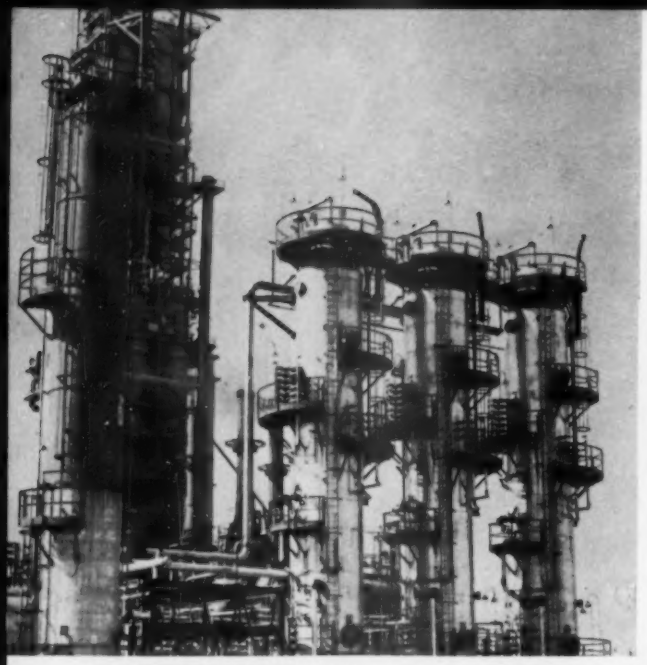


PROPANE DE-ASPHALTING, with rotating disc contactors, reduces the volume of resid at Sun Oil Co.'s Toledo refinery.

"We are looking for new processing and catalytic techniques," says the manager of a large refinery in the East, "that will enable us to make existing units more flexible, so as to avoid having to invest in new units."

"More flexibility is needed," says the process engineer of a refinery engineering firm, "to adjust refinery yields for maximum profit."

Refiners are looking for methods of getting higher yields of high-grade finished products from a wider variety of crudes—even the lowest-quality crudes, high in sulfur and contaminants. This is a big order.

Refiners are particularly hopeful that ways will be found to make better use of "the bottom of the barrel." Most of them feel that the practice of "running to coke" is no longer sufficient.

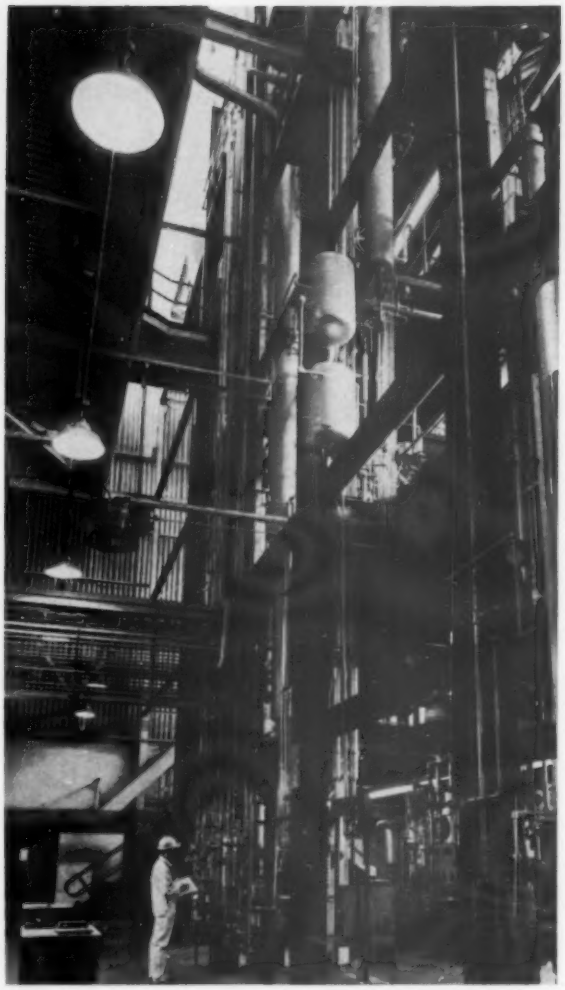
One major oil company in the East says: "We look forward to the development of a process to convert materials currently taken as residual fuels into high-quality, valuable products—either petroleum, petrochemical, or as raw materials for some metallurgical processing—via an economical technique. This would materially increase the profitability of refinery operation."

P. N. Gammelgard, vice-president of manufacturing of Pure Oil Co., told PETROLEUM WEEK: "One of the urgent problems that confront refiners in the '60s is how to process more adequately 'the bottom of the barrel.' They realize that here is a substantial percentage of the crude that is being sacrificed at a price well below its worth in terms of crude value."

"We must have 'creativity' at the bottom of the barrel," is how a Mid-Continent major expresses the same thought.

To make the order even more difficult, refiners also expect a substantial reduction in the number of steps between crude and finished products.

"It's difficult to believe," one refiner from the Middle West declared, "that after all these years of development, no method has been discovered to go from crude to gasoline without having to pass through all the successive units that are found in our refineries: crude still, vacuum section, cat cracker, hydrotreater, cat reformer, alkylation unit, and so forth."



HYDROCRACKING is one way to improve a refinery's yields. This is Union Oil of California's Unicracking pilot plant.

Hydrogen: A Panacea?

A more intensive use of hydrogen is generally expected to be one of the outstanding features of the next few years, and most refiners feel that hydrogen will be involved in some way in the hoped-for basic improvements.

Many in the survey expressed the hope that some process of hydrotreatment, with or without a new catalyst, would enable refiners to obtain in their plant both the flexibility and the upgrading of the "bottom of the barrel" that they want.

A substantial proportion of refiners are already using hydrogen, to treat the feedstocks going to several of their units, or to treat some of their finished products.

Over 50% of those who participated in the survey, in the U.S. and abroad, are already using a great portion of the hydrogen made available by their cat reforming operation. Most of it is used to hydrodesulfurize the feed-

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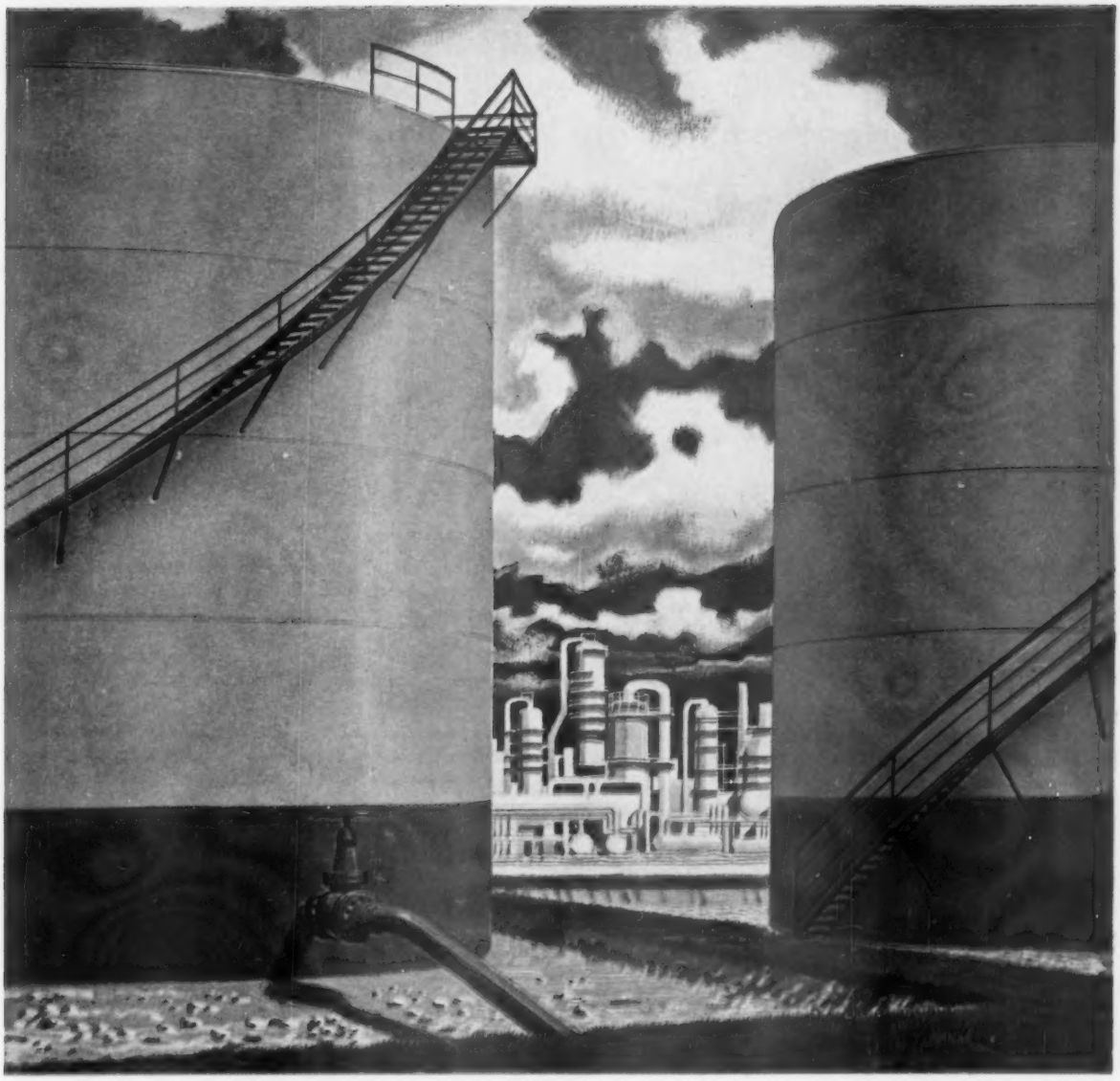

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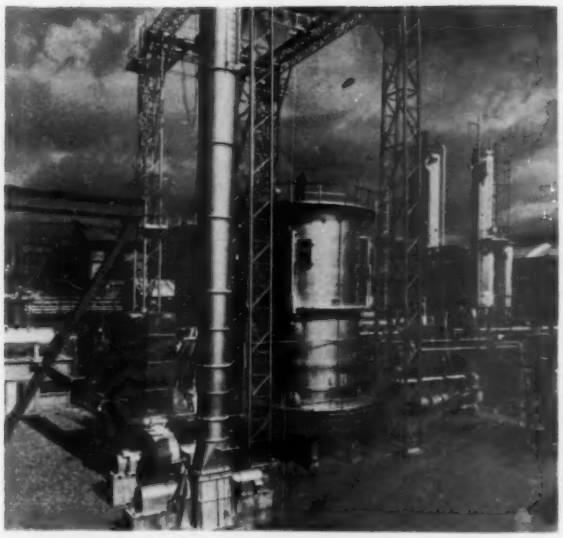


HYDROGEN IS MANUFACTURED from natural gas in France in high-pressure furnaces of Chemical Construction Co.

stocks to the cat reformers. In many cases, the quantity of naphtha hydrotreated is greater than the quantity that goes to the reformer; in these cases, the rest of the treated stream goes to a pool for further blending.

Finished distillates and lube oils are also hydrotreated in some refineries, but the practice is still relatively rare: fewer than one-third of the refiners in the U.S. hydrotreated their finished products in 1960.

Although more spectacular applications of hydrogen are expected in the future, the use of hydrocracking is looked upon by many as one immediate practical way of adding flexibility to refinery operations.

A major refiner in Texas says: "Improvements in hydrocracking are needed, even though it may become necessary to make hydrogen for that purpose."

And several refiners point to hydrocracking as a method "for obtaining higher yields of light products of better quality."

Three such hydrocracking methods are available at present. They are:

(1) The Isocracking process, developed by Standard Oil Co. of California, with units in operation, or under construction, at its Richmond (Calif.) refinery, at the Toledo (Ohio) refinery of Standard Oil Co. (Ohio), and the Avon (Calif.) refinery of Tidewater Oil Co.

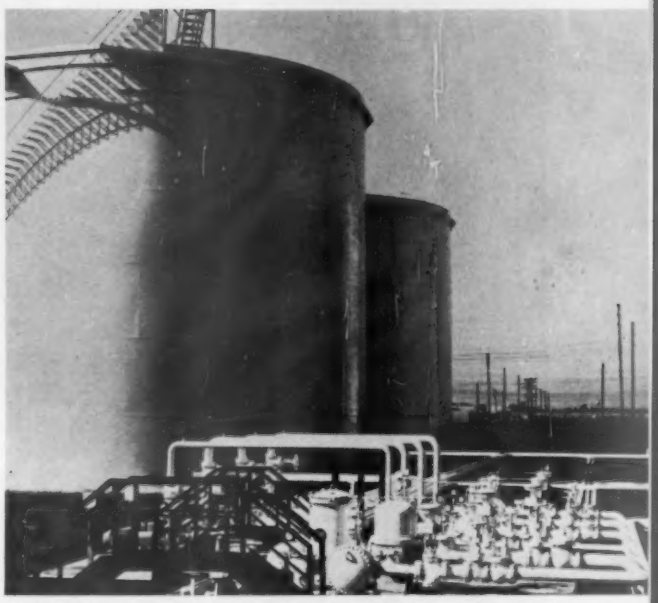
(2) The Unicracking process, developed by Union Oil Co. of California (picture).

(3) The Lomax process of Universal Oil Products Co., the first installation of which is now under construction at the Santa Fe Springs (Calif.) refinery of Powerine Oil Co.

There is little doubt that, with more hydrogen-consuming processes becoming the rule, some source of economical hydrogen will be needed to supplement the present supply from cat reforming operations.

Few refiners, to date, purchase hydrogen on the outside, the survey indicated. Such outside purchases are sometimes necessary in a new refinery until the cat reformers are on stream. Then these units supply enough hydrogen for present refinery applications.

Extensive development work is under way to devise simpler, less costly methods, for the production of hydrogen (picture).



AUTOMATIC IN-LINE BLENDING at Wilshire Oil Co. was installed by Proportioneers division of B.I.F. Industries.

To Be Up to Date, Automate

One technical development to which refiners point most consistently, as a means of improving their operations and reducing their costs, is automation—with or without specific reference to computer control.

Here is what a few refiners say by way of comment, to explain their selection of "automation" as potentially the most useful means of increasing refinery efficiency:

- "Generally speaking, I believe that automation in the sense of computer control, or 'closing the loop,' offers large potential profits, by maintaining an optimum economic product mix."
- "I would favor a complete refinery simulation program which, together with automatic blending, would select the best crude oil slate, and blend all refinery products to saleable finished products with a maximum of realization."
- "I would like to see more computer-backed 'operations research,' to accurately evaluate unit costs of products from well-head to consumer, and a more intensive use of small analog computers for in-plant tactical decision-making."

A study of computer-controlled installations made in the past two years, has already led to several useful conclusions. Among these:

(1) Considering the present high cost of a computer-controlled installation, the logical field for such applications today is to be found among large-volume processing units, where even a small increase in yield means a substantial yearly saving.

(2) The extensive study of refinery processes that must precede any application of computer control is always of enormous value, even though the computer may never be

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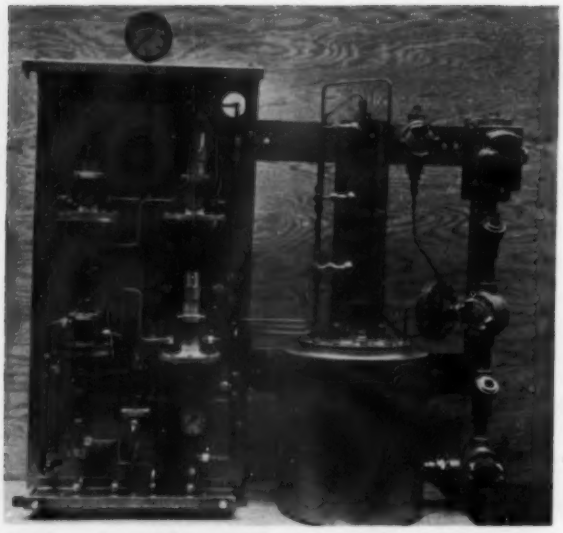

END POINT ANALYZERS, such as this Totco unit, are becoming a useful component of automatic control equipment.

installed. It results in better operation in nearly every case.

In parallel with the application of automatic control, especially with computers, significant improvements must take place in instrumentation and testing procedures.

Rapid, in-line testing, essential to automatic control, owes much to recent developments in high-speed gas chromatography (PW—Nov.18'60,p80), and to new instruments such as automatic, in-line distillation end-point analyzers (picture). But, several refiners pointed out at the recent WPRA meeting, rapid gas chromatography of high-boiling-point hydrocarbons still leaves much to be desired. Instrument manufacturers are working hard to close this gap.

The handling of petroleum products in refineries is another area where refiners feel that much improvement is needed, and where great savings can be achieved.

Over 20% of the returns indicate that such improvements would be helpful. Several factors can contribute to these improvements. For example:

- Greater integration will eliminate the need for intermediate tankage, simplify the handling of refinery streams, and conserve heat.
- Better tank construction, better tank location, and use of anti-evaporation methods will cut down evaporation losses.
- In-line automatic blending will substantially reduce handling costs and improve products at the same time (PW—Apr.14'61,p48).
- Better layouts and more automation in warehousing, loading, and shipping practices are also conducive to significant savings, regardless of the size or location of the refinery.

Maintenance operations constitute another field where much improvement is in order, according to most refiners. This is one of the areas most consistently pointed to in the survey. Refiners feel that maintenance can be improved in several ways:

- By a better layout of the refinery to facilitate maintenance operations;
- By a better design of the equipment, to allow easier access to all parts, and faster dismantling and reassembling operations when needed;
- By using better materials, to minimize physical and chemical damage (wear and corrosion, respectively);
- By better organized maintenance techniques;
- By more use of contracted maintenance.

How the Principal Refining Processes Stack Up

There has been little change recently in the conventional methods of refinery processing. The cat cracking, cat reforming, and alkylation units that have been installed in the past few years show no significant changes as compared with earlier units, except for a trend towards larger unit capacity.

Cat cracking is still the workhorse of the typical U.S. refinery. About 52.5% of refinery throughput went to cat crackers in 1960.

There is still a substantial quantity of thermal cracking being done, and visbreaking is still popular. In some cases, the old thermal still is a combination crude still and cracker (PW—Apr.14'61,p50). Some thermal crackers are being converted into coking units.

Over three times as many refiners increased the severity of their cat reformers in recent years as decreased it. About 18.25% of refinery throughput in the U.S. was cat reformed in 1960.

Great differences appear in the survey in the quantities of reforming stock handled between two consecutive regenerations of the catalysts. Refiners express these quantities in two different ways: In barrels of feedstock per pound of catalyst, the quantities vary between 35 bbl. and 20 bbl.; in total throughput handled between regenerations, the quantities vary between 60,000 bbl. and as much as 7-million bbl. These differences bespeak the great differences between naphthas used as feedstock in the U.S., as well as differences in severity of cat reforming operations.

Alkylation has been gaining favor in the U.S., as an effective method of producing high-quality gasoline with low sensitivity—that is, less difference between the motor and the research octane ratings. About 6.75% of refinery throughputs are alkylated blending components, against 6% in 1958. Nearly all U.S. refiners (90%) purchase at least some of the butane (or isobutane) needed for the process.

On the other hand, the practice of polymerization has decreased markedly, and little is done today, except in some cases where the unit is operated in conjunction with the alkylation unit—or to make low-molecular-weight polymers. All these polymerized products constituted less than 4% of refinery throughputs in 1960.

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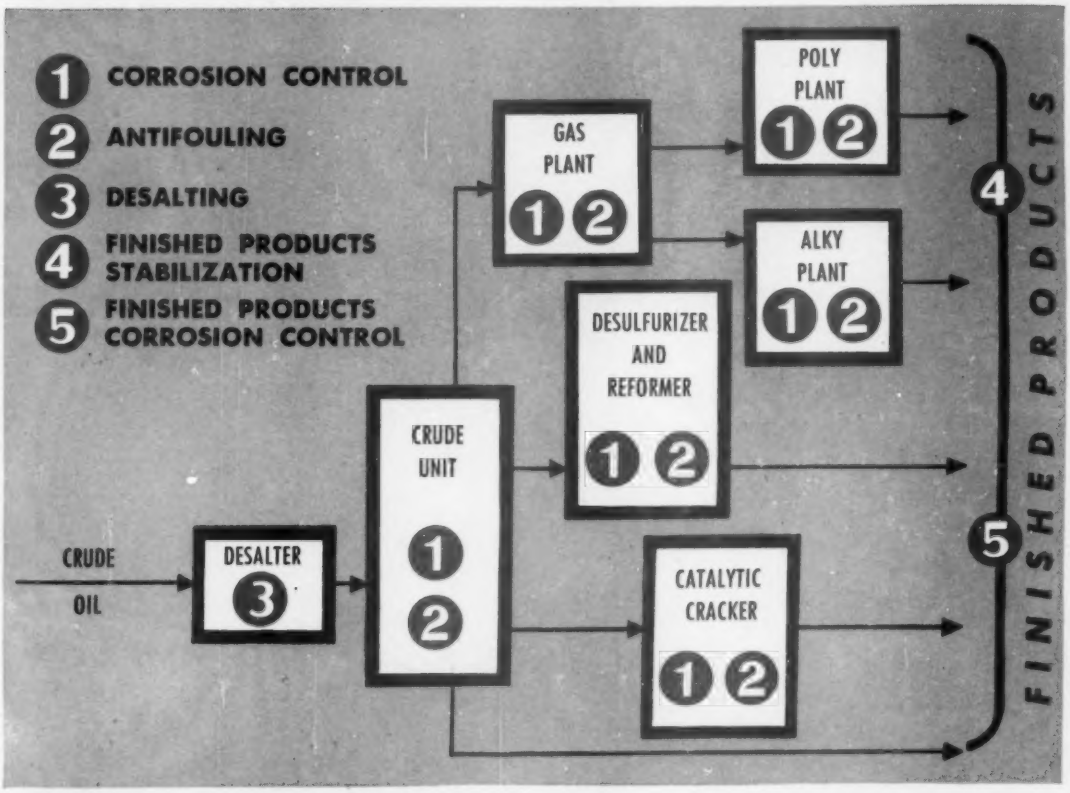

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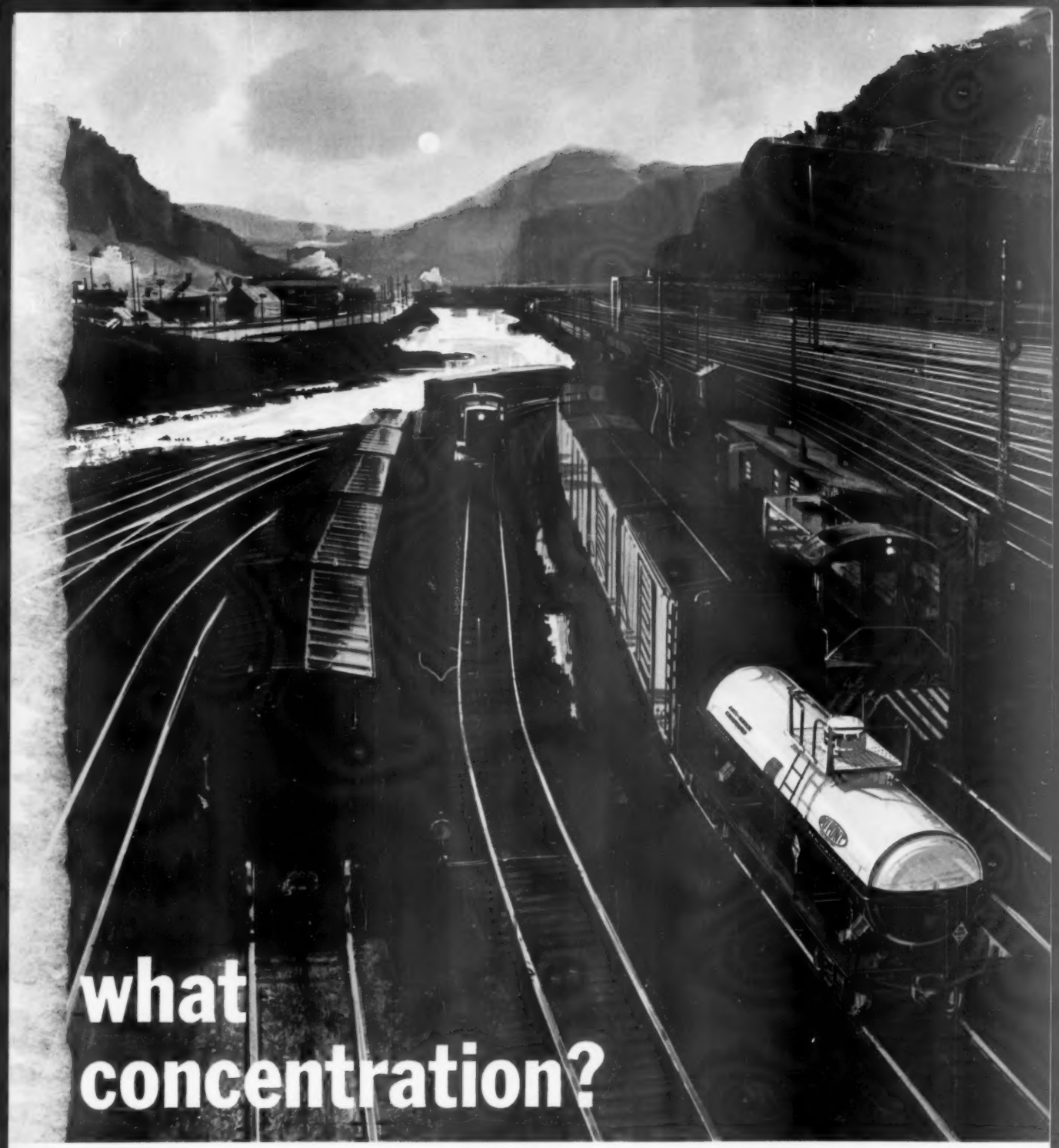

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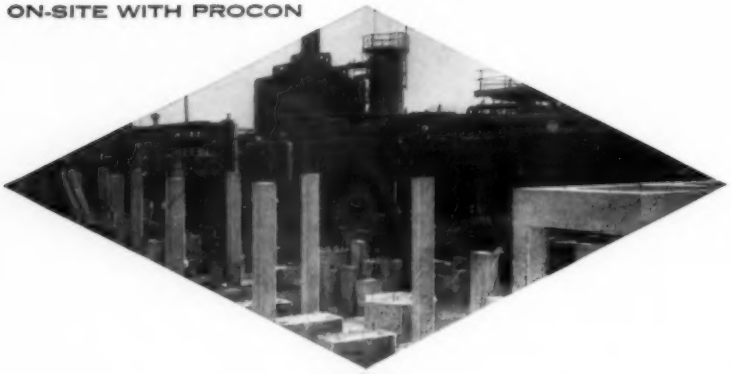

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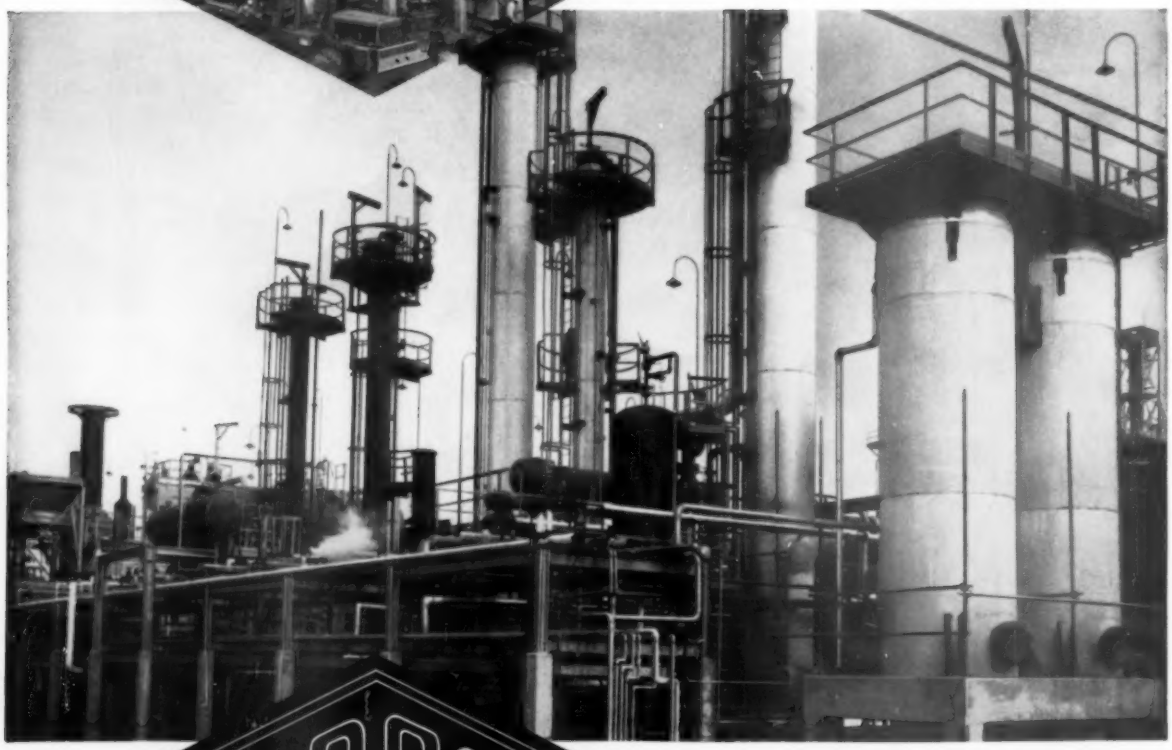

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Productivity Is Rising

A substantial reduction in refinery manpower has taken place in the past few years. Such a reduction is noticeable among independents as well as among major refiners.

It is due essentially to two factors: (1) Wider application of refinery automation; and (2) greater use of contracted maintenance.

In 1958, U.S. government records indicate, 15.9 employees were needed for every 1,000 b/d of crude oil processed in the U.S., exclusive of administrative personnel. In 1959 the ratio had declined to 14.8 men per 1,000 b/d, and the first 11 months of 1960 show a further reduction.

The refiners who participated in the PETROLEUM WEEK survey employ an average manpower of 11.7 men per 1,000 b/d of throughput. (The latter figures, however, do not include refiners who manufacture essentially specialties, such as asphalts or lubricants, for the preparation and handling of which a much greater manpower is always required.)

In many cases, however, the reduction of manpower is more apparent than real: It results from a different distribution of personnel. For example, employees who work for maintenance contractors, or painters, or guards are not counted as refinery personnel, although they may work in the refinery a substantial portion of their time.

Refiners, almost unanimously, point out that the addition of an electronic computer to a unit already controlled automatically does not bring about any further manpower reduction.

It would be unrealistic to pretend that automation does not bring about a reduction in manpower. But once a certain process has become automated—mechanically, pneumatically, or electrically—the use of a computer to optimize its operation does not generally reduce further its need for human attention.

To relocate personnel displaced by automation is always a problem, refiners indicate.

But the versatility of the oil industry, the many interests that are attracting oil companies—some even entirely foreign to petroleum, such as exotic chemical ventures, mining, metallurgy, nuclear power, rocketry—usually provide ample occupations for those from whom "the machine has stolen the jobs."

Educational programs, in the years to come, should make these shifts of personnel less difficult, refiners hope. They should provide young people with enough adaptability to consider these shifts without panic, whether they occur in the type of work to be done, or in geographical relocation.

It is becoming increasingly evident that the trend is toward the employment of more "white-collar" type workers in refineries, especially in the U.S.

Refiners predict that a significant change will have to take place in our educational system: The ability level of the average refinery worker will have to be upgraded to fit the new conditions. The machine will handle, automatically, heavy, tedious, or menial tasks, but capable operators and specialists in many fields will be needed to study the processes, prepare the programs that will be fed to the machines, supervise them, and maintain them.

ESSO REFINERY AT COLOGNE, Germany, is typical of overseas refineries, with crude still, reformer, and hydrotreater.

Conditions Different Abroad

Refining operations overseas differ significantly from domestic operations, because of the entirely different economic pattern in foreign countries.

The differences occur mostly in the pattern of demand, the yields of various products, and the methods used, the survey showed.

The trend toward automation is noticeable overseas as well as in the U.S., but its pace is substantially slower.

This is due to two main reasons, a major refiner with international operations told PETROLEUM WEEK.

- First, the rate of payout is much slower abroad, because of the lower cost of labor.
- Second, specialists familiar with delicate control instrumentation are more difficult to find, especially in countries that are still underdeveloped.

Foreign refining activity is high. With few exceptions, operation in 1960 was closer to full capacity than in the U.S.

An over-all "percentage of installed capacity" doesn't have much meaning where so many different conditions come into play. But the majority of foreign refineries, whether under American or foreign management, operated above 88% of capacity. The average works out to 99% in Belgium, 96% in Germany, 88% in Great Britain and Ireland, 83% in Italy, 87% in Japan, 95% in Spain, between 96% and 100% in the Middle East. The average varies between wider limits in most countries of South America.

Many new refineries are under construction, many more are planned for this year and next, and it is generally feared that considerable overcapacity will result in the near future. Over 500,000 b/d of refining capacity is planned or under construction throughout the world at present.

"Overseas demand for petroleum products," a major oil company spokesman told PETROLEUM WEEK, "is continuing to grow at a rapid rate. But so is refinery construction. There are already indications that substantial

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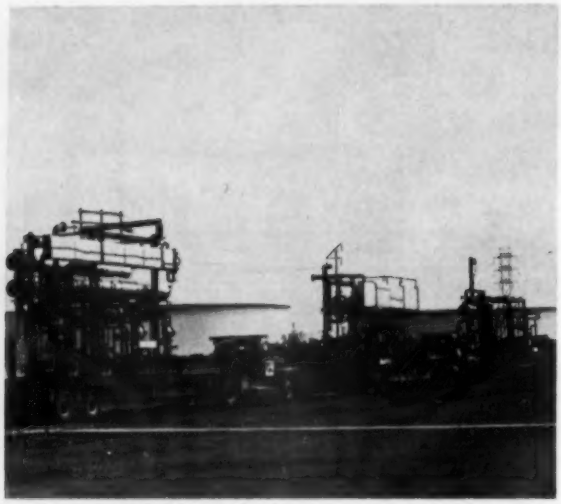


SMALL REFINERY IN GUATEMALA, owned jointly by Shell and Breaux Bridge Refining, gets to its location on skids.

excess capacity will exist in Europe as early as 1963. With the rapid trend toward construction of refineries in many consuming countries, it seems likely that substantial surplus capacity will develop at the export refineries in the Caribbean area and the Persian Gulf."

"Decisions to invest in a foreign refinery," says Walter Levy, international petroleum consultant, "are in many instances governed not by the return expected from that investment, but by the necessity to dispose of available crude oil and the desire to maintain—or expand—foreign market position."

The restrictions on crude imports into the U.S. is leading many U.S. companies that formerly had little or no interest in foreign refining, into foreign refinery ventures. For example, Continental Oil Co.'s Panama refinery, Ohio Oil Co.'s Spanish venture, Tidewater Oil Co.'s refinery under construction in Denmark, American Independent Oil Co.'s project in Southern Rhodesia.

Many foreign-owned, foreign-built refineries are also under construction.

Companies that operate large "export-type" foreign refineries wonder how the market will be affected by the many small local refineries that are sprouting all over the world.

They hope that the improvement in the standard of living in the countries where these refineries are being built will result in an increased demand for petroleum products, but are somewhat fearful that it will take a long time before the increased demand for these products will balance the rapidly growing supply capacity.

The relative yields of various products, in foreign refineries (not including Canada), differ widely from the corresponding yields in the U.S. Residual fuel, not gasoline, is at a premium abroad.

In 1960, the average yields from European refineries were the following, according to the survey: Gasolines, 15.6%; distillates, 32%, and residuals, 41%. This is almost exactly the reverse of the situation that prevails in the U.S. The proportion of residual fuel obtained from crude abroad—especially in Europe—more or less corresponds to the proportion of gasoline obtained from crude in the U.S., and vice versa; while the proportion of distillates tends to average about the same the world over: approximately 32%.

A somewhat similar proportion of various yields is noticeable elsewhere:

- The Japanese pattern in 1960 seems to have followed the European trend, only more so: the emphasis is on residual fuel, to the extent of 61%.
- The Middle East presents roughly the same picture, with the middle-of-the-barrel distillates varying between 20% and 37%.
- The South American refining picture is more irregular. It varies substantially from one country to the next. On the average, gasoline production is around 29%, and distillate around 34%.

To produce these different yields, refinery processes in overseas refineries differ somewhat from U.S. practice. The main differences are:

(1) Less need for crude desalting units.

(2) Lower proportion of cracking—about 36.5% of refinery throughput in 1960, against 52.5% in the U.S.

(3) Higher percentage of reformer throughput—19.6% against 18.25% in the U.S.

(4) Much less use of alkylation and polymerization.

The North African petroleum discoveries are causing considerable speculation among European as well as American refiners.

"No one today can predict what will be the impact upon the European economy of the vast quantities of oil and gas available in North Africa," Willard K. Rice, petroleum financial consultant of New York and Algiers, told PETROLEUM WEEK.

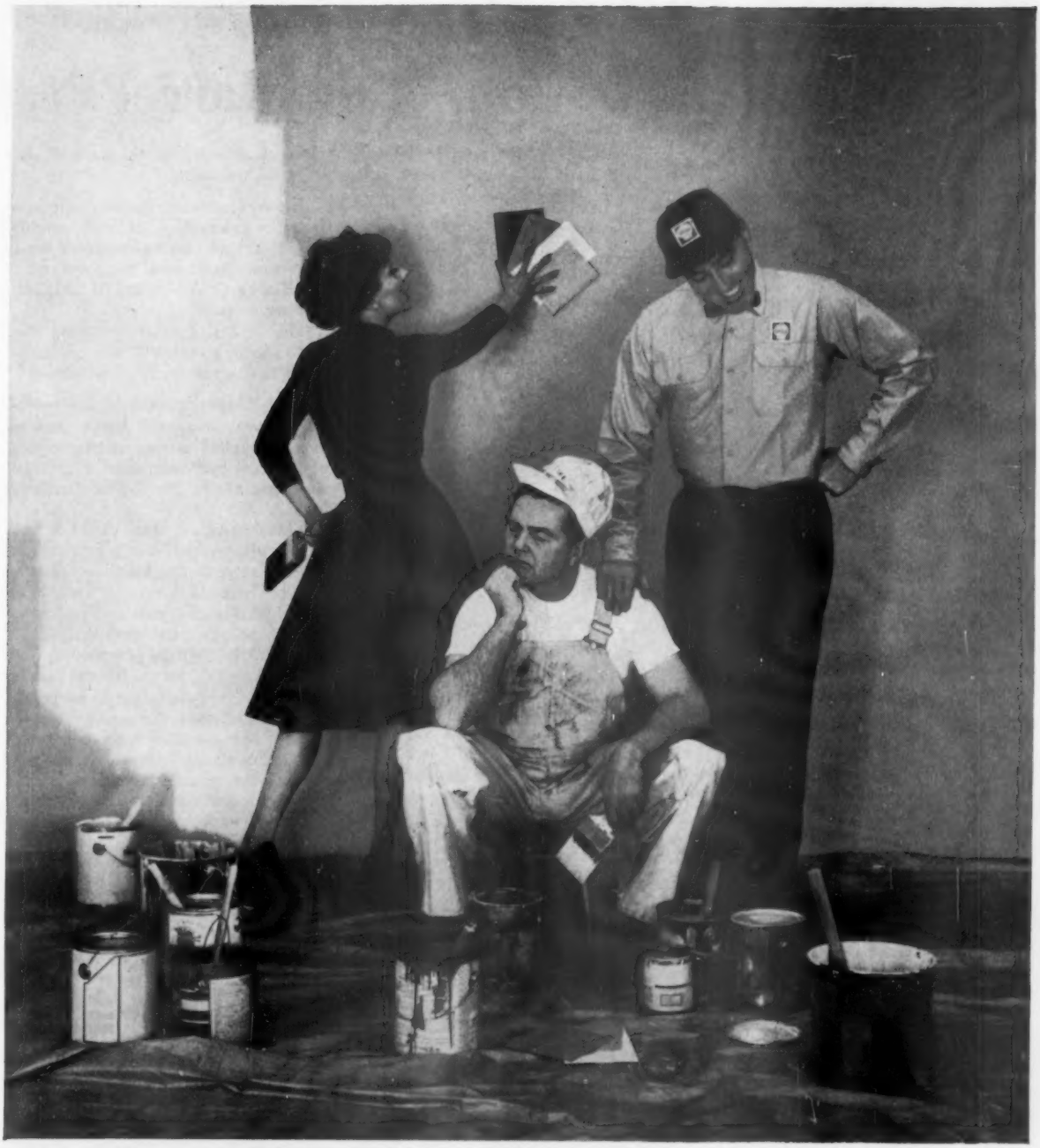
"Actually," said Rice, "it is too early to predict what the bulk of the North African production will be—natural gas, natural gasoline, or high-quality crude—and what area of the present European economy it will affect mostly. It will depend, to a great extent, on the most economical method selected for the transportation of that production to Europe: by underseas or floating pipelines, difficult and costly to build and to maintain in the Mediterranean, or by tankers."

"The Sahara crude," says the foreign operations manager of a major oil company, "completely upsets operations in existing refineries in Europe. These refineries were built to process Middle East crude. Most of their units are useless for this extremely volatile, very-low-sulfur African crude. They will no doubt be allowed to keep on running on Middle East crude, providing that they can dispose of their share of Sahara crude. I wouldn't be surprised if some of this crude came to the U.S."

Manpower productivity appears to vary greatly from one country to another, and even among refineries in the same country.

For example, in both Italy and Japan, the number of refinery employees per 1,000 b/d, as reported in the survey, varies from 6 to more than 30.

In certain South American countries, the control of refinery personnel is entirely out of the hands of the management, according to spokesmen for oil companies operating there; it is handled arbitrarily by local labor unions.



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HDS Makes the Bottom of the Barrel Pay

More upgrading of petroleum residues will soon be possible thanks to the development of more effective hydrodesulfurization catalysts.

Substantial improvements have already been achieved in hydrodesulfurization in the past six years, H. Beuther, of Gulf Research & Development Co., reported at the midyear meeting of the American Petroleum Institute's Division of Refining, in Houston this week.

Using 5.5-gravity Kuwait vacuum residue with 5.5% sulfur content as an example, Beuther showed how the Gulf HDS process had progressed: In 1955, it was capable of reducing the sulfur content to 2.5% and to make an 11-gravity product (PW—May 13'55,p32); now, the sulfur content can be brought down to 0.5%, and the crude upped to 15-gravity.

At the same time, it will be possible to lengthen significantly the interval between consecutive catalyst regenerations.

When the HDS process was initiated, Beuther explained, the onstream cycle was from 4 to 24 hours. Through a better understanding of the reaction mechanisms, and the development of more active and selective catalysts, it has been possible to extend the process cycles to between one and six months, he said.

Hydrodesulfurization of residues, which upgrades "the bottom of the barrel," is done for several purposes. One is to produce better, lower-sulfur fuel oils.

Low-sulfur fuel oil of the No. 6 variety is required in some industries and is often specified in certain areas to reduce atmospheric pollution. But the premium that refiners can expect for such a low-sulfur fuel is seldom enough to justify an HDS treatment, unless it is completed by some hydrocracking. Then, enough additional gasoline and heating oil are produced to make the combination pay, Beuther said.

In this case, the HDS treatment is what Beuther referred to as a "mild process," performed at about 1,000 psi. and with a cycle of three to four months. The feedstock may be:

- Vacuum residue. Here, a combination of HDS with visbreaking may be the most profitable solution.
- Atmospheric residue. Either with Kuwait crude or with a lower-sulfur West Texas crude, the final product has a sulfur content below 1%, and holds less than 0.1 parts per million of vanadium—an objectionable metal.
- Full crude oil. Here, after removal of sweet distillate and sweet gasoline, the heavy fraction contains about 1.6% of sulfur, and can be used directly as No. 6 fuel oil. This technique, Beuther pointed out, is particularly useful to overseas refiners who do not utilize cat cracking.

A second reason for hydrodesulfurization is to produce a better feedstock for cracking.

In this case, the process is more severe; it is conducted at pressures above 2,000 psi. It results in the saturation of a significant amount of aromatic compounds, and produces a very high molecular weight aliphatic oil of exceptional cracking qualities. Better yields of higher-quality gasoline can thus be obtained than from straight-run gasoil.

An atmospheric residue is preferable to a vacuum residue, Beuther said, when the pressure of HDS is kept between 2,000 and 3,000 psi. But when a pressure as high as 6,000 psi. is used, vacuum residue is equally satisfactory. Such a high pressure may be advisable, according to Beuther, to be able to charge the heaviest residues, and still obtain very little aging (loss of activity) of the catalyst due to metal poisoning.

The hydrodesulfurization technique for the production of high quality cracking stock can be improved when the asphaltenes are removed from the charge (PW—Mar.3'61,p33), according to Beuther.

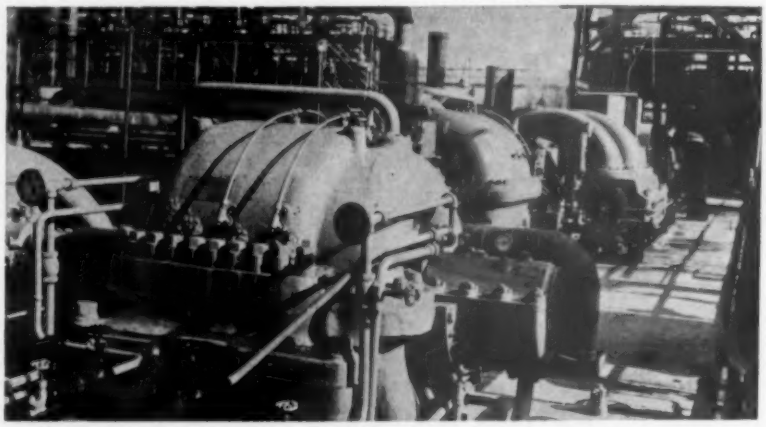
The details of de-asphaltening residuals with a solvent are presently being developed by Gulf Research.

Further development of this method of processing will hinge around two problems: an adequate supply of low-cost hydrogen, and a catalyst that maintains its initial activity longer.

Theoretically, it takes about 80 cu. ft. of hydrogen per bbl. to remove 1% of sulfur from a residual feedstock. When hydrocracking is combined with hydrodesulfurization, the hydrogen consumption increases sharply. In practice, the hydrogen consumption —for example, for a Kuwait crude residue—is 750 cu. ft. per bbl. treated.

All engineering companies are actively seeking a process to reduce the cost of producing hydrogen.

And the search continues, meanwhile, for catalysts which selectively reject asphaltic and metal-containing compounds, in an effort to reduce coke formation and metal poisoning with concurrent de-activation of the catalyst.



Water Washing Prevents Dirt Buildup

The dirty gases that enter this multistage centrifugal gas compressor, in a butadiene manufacturing plant, are washed away by a series of spray nozzles, and a water-buffered seal. Thus, the matting of dirt particles on the inside surfaces of the compressor is avoided. This gas washing process, developed by Allis Chalmers Mfg. Co., is also available for high-volume single-stage gas compressors.

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Selling and buying processing equipment is a highly developed field, but essentially it consists of buying and selling ideas. As your career advances into supervisory, management, and executive functions, you will be called on to exhibit greater buyer-seller abilities. Buying and selling, directly or indirectly, are the heart and pulse of your company's business activity.

Most buying in industry involves from three to six individuals. Although the purchasing agent will be a key factor in all purchasing, almost all purchases in technical fields require the technical assistance of someone outside the purchasing department.

An industrial buyer, whether he is a purchasing agent or an engineer, is *human*, and is responsive to the same human values that you are when you buy a car or a suit of clothes. The industrial purchaser, though, is keenly aware of the plant and organization for which he buys. He is conversant with the product needed, and with its ultimate use.

The purchaser's objective is to procure the right equipment or material, of the right quality, in the right quantity, at the right time, from the right source, and at the right price. In accomplishing this he actually becomes a "salesman-selling-a-salesman."

In modern business the purchasing department should be a profit-making department. A four per cent savings in purchase costs, for instance, might be equal in profits to a 20 per cent increase in sales volume. Considering that the average industrial firm spends about 50 to 60 cents of each sales dollar for purchases, purchasing savings can easily represent the margin of profit.

In one large steel company, costs of products and services bought exceeds four million dollars for each working day. The variety of products bought is in the tens of thousands and these are purchased from nearly 50,000 suppliers. Obviously there is terrific opportunity for savings in the art of purchasing.

FOOTNOTE: These are the opening paragraphs of Western's latest "professional advancement" series, Booklet E-10, entitled "Buyer-Seller 'Alliance': Important to Engineers". Your copy is free upon request. Write to Western Supply Company, Heat Exchanger Division, P.O. Box 1888, Tulsa Okla.—where "buyer-seller" relationships are important in the delivery of quality-design heat exchangers.

Is On-the-Spot Lube Reliable?

The use of heavy residual fuel in large diesel engines, especially on board ships, may lead to serious problems. One of these problems is their correct lubrication.

The question of how best to protect these engines, and still retain the benefit of using an economical fuel, led to an animated discussion at the recent Oil & Gas Power Conference of the American Society of Mechanical Engineers, in New Orleans.

J. M. A. Van Der Horst, president of Van Der Horst Corp. of America, Olean, N.Y., gave the results of experimental work conducted by his company on a two-cylinder, two-stroke uniflow Bolnes diesel, of 7.48-in. bore, producing 50 hp. per cylinder at 430 rpm. Heavy residual fuel, of 450 Redwood viscosity @ 100F, and containing 2.5% of sulfur, was burned.

Correct lubrication of these large diesels is essential, to prevent the high maintenance costs and damage that would otherwise be caused by the use of residual fuel oil instead of diesel fuel.

The cost of residual fuel is from 36% to 58% lower than that of diesel fuel, according to the location; a 100,000-hp. tanker burning residual fuel, for example, may save as much as $150,000 a year, Van Der Horst said.

Against such a saving, certain drawbacks must be taken into account: heavy fuel must be heated and centrifuged, and engine maintenance is generally higher when residual is used.

The problem of engine wear, in particular, is a serious one with heavy fuel, and steps leading to its reduction are always welcome.

Wear, in these engines, takes place in two ways: by abrasion, and by electrolytic action. The latter occurs because the high sulfur content of the products of combustion transforms the engine into an electrolytic cell, composed of the piston, the combustion products (as an electrolyte), and the cylinder.

One proven method to reduce wear in these engines is to use a strongly alkaline lubricant, often applied in emulsion form.

But, said Van Der Horst, there are objections: It is sometimes difficult to maintain the alkaline agent well dispersed in the oil. Then, he said, each case ought to be treated individually, because too much alkalinity in the lube is as bad as too little. Finally, the special lubricants available for these jobs cost two to three times as much as a straight-run lube.

Some operators have concluded that the most effective way to make use of these alkaline oil emulsions is to prepare them on the spot.

Van Der Horst described the emulsifying equipment which his company started to install a few years ago on board ships: It enables an operator to add to a less-costly straight-run lube oil, in emulsified form, a carefully calculated amount of a solution (in water) of magnesium chromate. He told the conference of wear measurements that were recently taken on several types of diesel engines using residual fuel, in order to compare the effectiveness of commercially available oils with emulsions made in these on-the-spot units.

"It would be premature," he said, "to claim that the emulsion prepared on the spot performs better, in view of the relatively limited number of results and the limited time of experience. The possibility should not be excluded, however, that it does indeed show a better performance."

However, there are serious objections to this on-the-spot method of preparing lubricants, according to many refiners who took exception to Van Der Horst's presentation at the conference.

Jack Cox, of Shell Oil Co., explained that his company's specially prepared alkaline oil—either in emulsion or non-emulsion form—is being used in hundreds of diesel-powered vessels that operate on residual fuels with 2% to 3% of sulfur content.

"Obviously," said Cox, "a lubricant carefully developed in the laboratory, thoroughly field-tested, and used successfully for many years, would be expected to be more reliable than an emulsion prepared on the spot, without laboratory control.

Furthermore, alkalinity is not the only requirement to be met by a cylinder lubricant. There are other important factors to be considered, which just any alkaline emulsion using shipboard straight mineral oil does not necessarily satisfy. Regardless of the components used in compounding it, the lubricant is a material which, in addition to curbing corrosive attack, must be kept neutral and harmless in other important areas."

John Gibb, of Socony Mobil Oil Co., added that most oil companies have a special oil for diesels that are using heavy fuel, with an impressive record of satisfactory usage. The proper concentration of various chemicals in an oil is not something that can be guessed at, he said, nor can it be eas-

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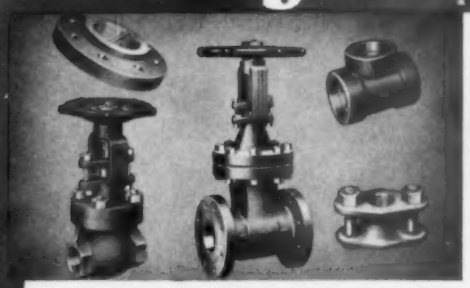

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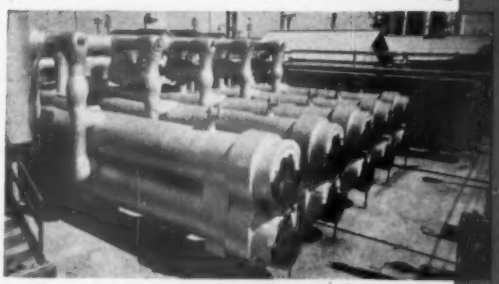

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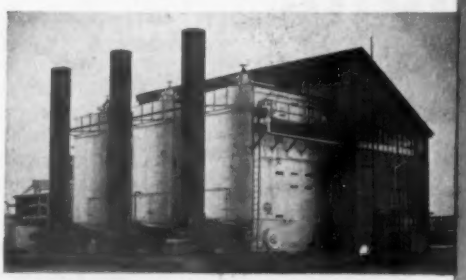

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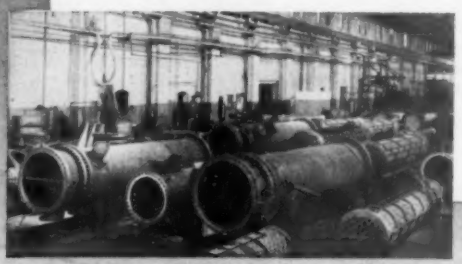

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ily modified; it may be critical. It is also very doubtful, he pointed out, that the maritime unions will permit their members to be burdened with such additional responsibility without additional compensation.

Another way to prevent excessive wear seems to be the use of chrome-plated liners and properly designed oil grooves, according to Van Der Horst.

He reported the satisfactory results of porous chrome-plated liners in a great variety of engines after long periods of operation.

Analyzers, Key to Automation

Several on-stream analyzers, plus a simple analog computer, may often be the most economical solution to a problem of automatic control of a processing unit, in a refinery or petrochemical plant.

When automation is being applied to a process unit—especially when electronic computer control is being considered to maintain optimum conditions—frequent and rapid analyses of various streams in the process must be made. To carry samples of these streams to a laboratory for conventional analysis would be much too slow, and generally impractical. The problem can often be solved by the use of on-line analyzers on the various streams, with a simple, inexpensive computer to process the data from these analyzers.

At the recent symposium of the Instrument Society of America, in Houston, Robert M. Green, of the systems engineering division of Foxboro Co., explained how to do it.

The technique is based on the fact that if you know certain physical properties of component streams, a computer can generally calculate the effect of these properties upon the specification of the resultant product.

Green considered, as an example, the process wherein two components are being blended into a third one of constant composition, with the requirement that the final blend have certain specifications, difficult to measure by an on-stream analyzer. Green assumed that the two properties of the variable constituent streams—for example, their specific gravity and their electrical conductivity—affect the desired specification of the final product, and that these effects can be put into equations.

Then, Green explained, by using two simple on-stream analyzers—one measuring the specific gravity and the other the conductivity—and by feeding the results of the analysis, continuously, to an analog computer, it is possible to keep tab on the quality of the effluent product.

The "non-specific" analyzers used for checking these physical properties are generally much simpler than a more specific analyzer that would be needed to monitor the desired specifications of the product; the saving may be substantial.

Green described to the ISA symposium the difference between specific and nonspecific analyzers:

A specific analyzer would be one capable of measuring one very specific, and generally complex, property of a stream—for example, the butane content of a C_4 mixture, or the octane rating of a gasoline.

On the other hand, a nonspecific analyzer could be a thermocouple, a pH analyzer, an automatic end-point analyzer, a gravity meter, or a dielectric meter.

Not only are nonspecific analyzers less costly, they are also generally more accurate, according to Green.

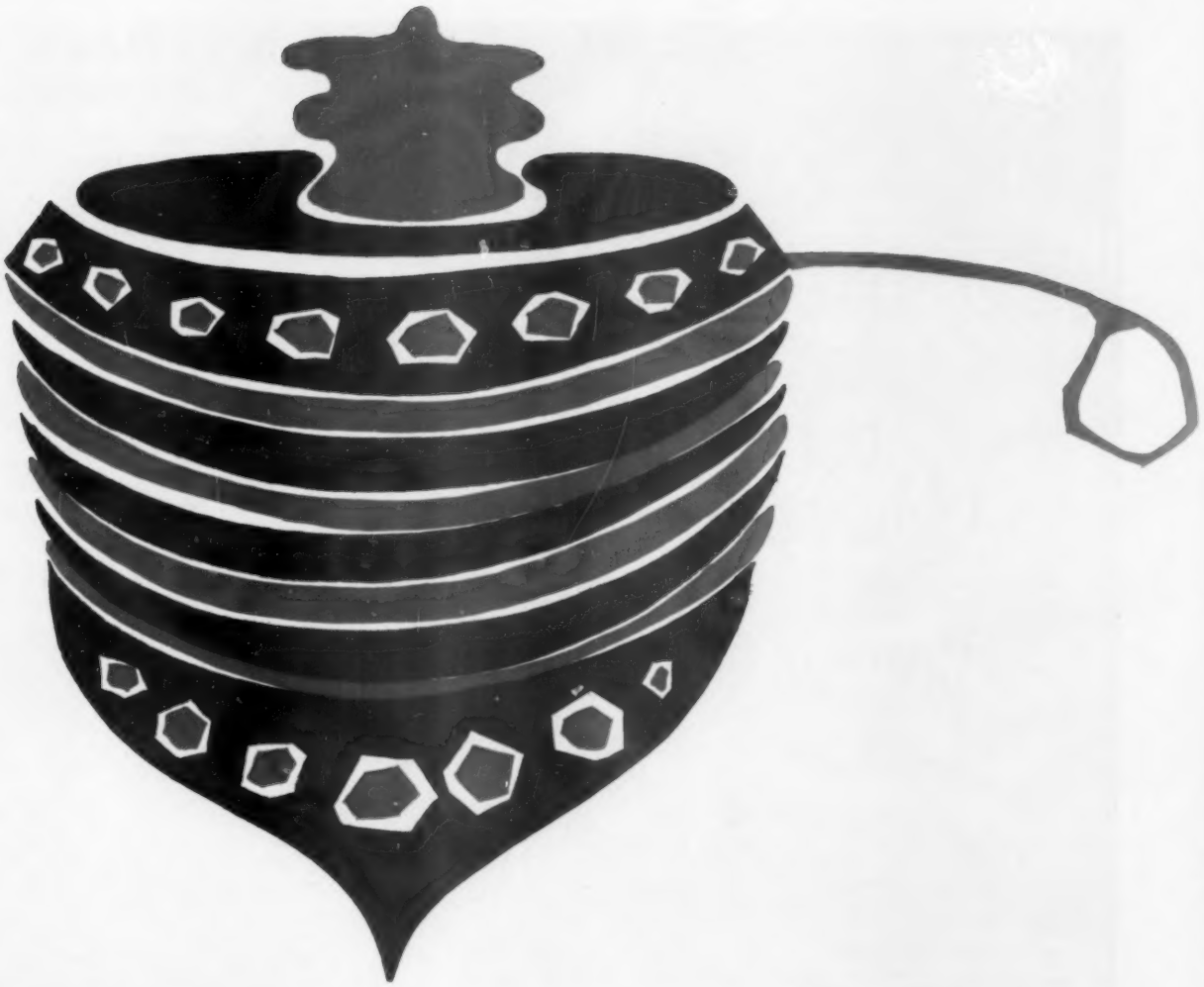
"In actual practice," he said, "analyzers made of off-the-shelf components, and using simple analog computers, easily give better than $\pm 0.5\%$ accuracy, as against $\pm 1\%$ calibrated accuracy for more specific stream analyzers."

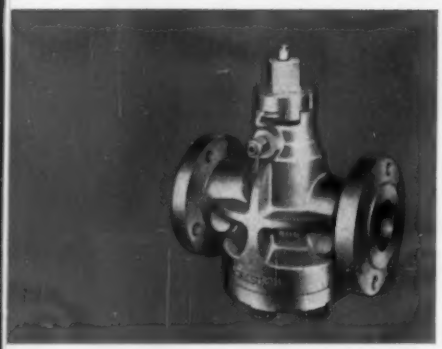
After nonspecific analyzers have been selected, local conditions will determine, for each process, what sort of a computer, or combination of computers, will complete the job most economically.

All that may be required to control the process may be one, or several, inexpensive computers—analog or digital—to process the data from the nonspecific analyzers, and control certain mechanical features of the unit, Green said.

On the other hand, it may be necessary to feed the information from these simple computers to a larger computer—which may be located somewhere else in the plant—to achieve and maintain optimum operation of the unit.

In still other cases, it may be found that a single, large process computer is the best solution, to process the data from the various nonspecific analyzers, interpret them, and control the process at its optimum rating on a so-called "closed-loop" basis.





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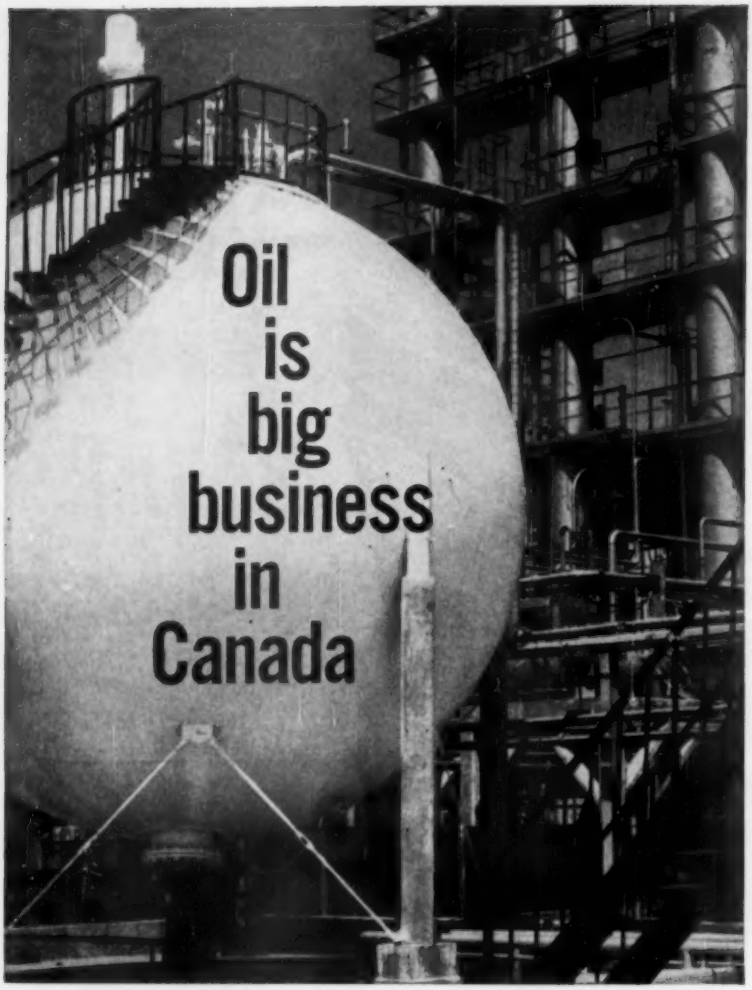

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What's New
IN PROCESSING

Nuclear magnetic resonance spectroscopy (PW—Jun.10'60,p32) and infrared spectroscopy (PW—Nov.18'60, p80) will eventually work side by side in the laboratory, according to Dr. Herman Szymanski, of Canisius College, Buffalo, N.Y. The NMR instrument will be used for specialized analyses not easily solved by the infrared spectroscope, and vice-versa.

Among these jobs will be the structural analysis of compounds, such as CH_3CHO (methyl aldehyde). The number of protons in each functional group—the CH_3 group on one side, the CHO group on the other—determines the intensity of the signal given by an NMR machine; thus, the structure can be detected without preliminary and complicated molecular-weight determination, such as would be necessary if the structure were studied by infrared spectroscopy alone.

And much smaller structural differences can be detected with the NMR instrument, Szymanski says. For example, in a compound such as CH_3-CH_2-CH_2-CH_2-C≡C-H, the NMR spectra distinguish easily, among the CH_2 groups, that one which is next to the triple bond. This would be a difficult determination by infrared analysis alone.

•

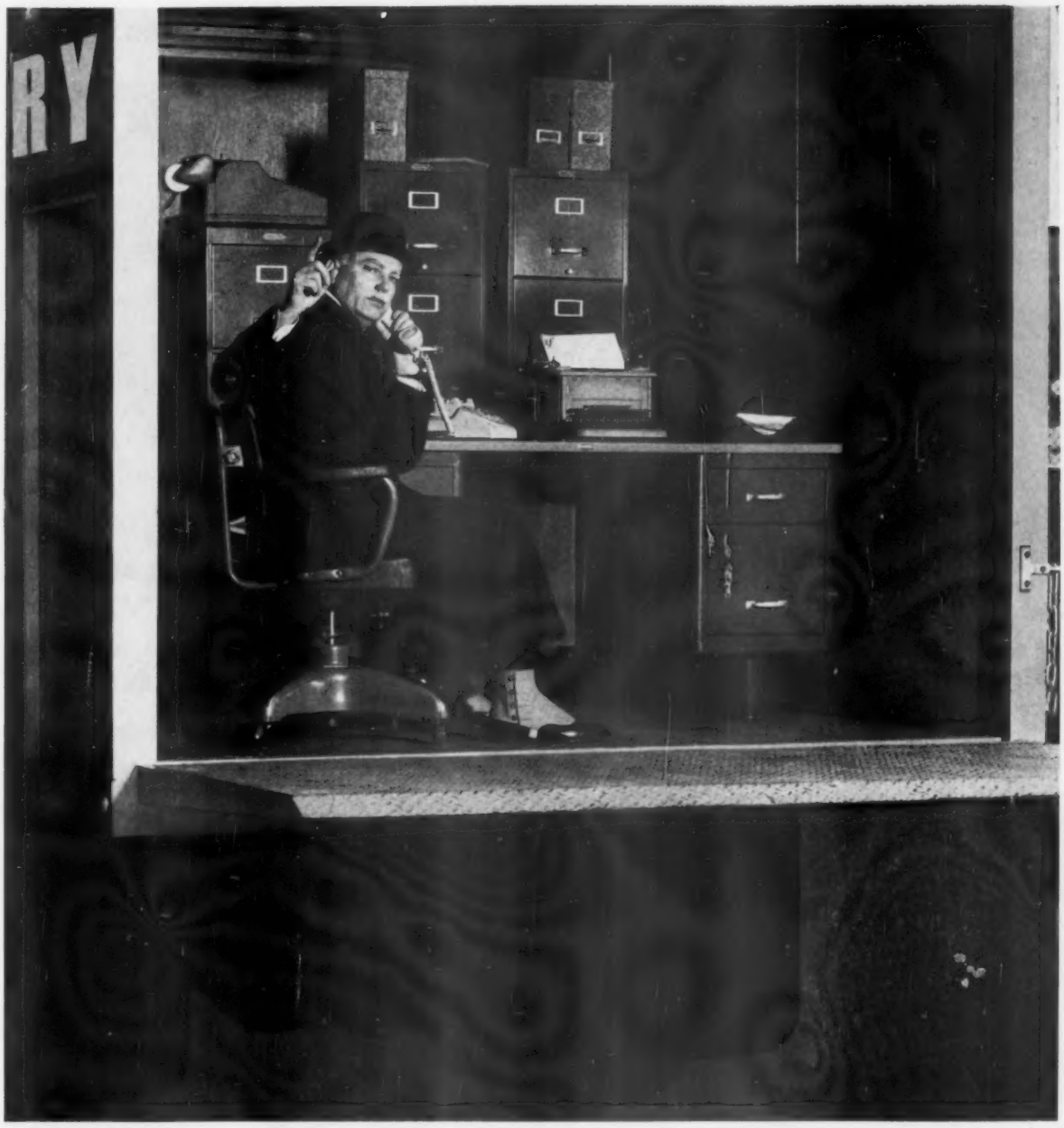
The San Francisco Bay Area refineries will spend an additional $8-million to $10-million by the end of 1962, to be in full compliance with anti-industrial-smog Regulation 2, according to Benjamin Linsky, control officer of the Bay Area pollution control district.

Major refineries involved include those of Union Oil Co. of California, at Rodeo; Shell Oil Co., at Martinez; and Tidewater Oil Co., at Avon. Standard Oil Co. of California, at Richmond, is already in full compliance.

•

California Chemical Co.'s new 20-million-lb.-per-year maleic anhydride plant is on stream at the Richmond refinery of Standard Oil Co. of California, adjacent to facilities for producing phthalic anhydride, isophthalic acids, and other products derived from benzene and xylenes. Badger Mfg. Co. constructed the plant.

Maleic anhydride is produced by the air oxidation of benzene in a fixed-bed catalytic reactor system. The process was licensed through Badger by Reichhold Chemicals, Inc.



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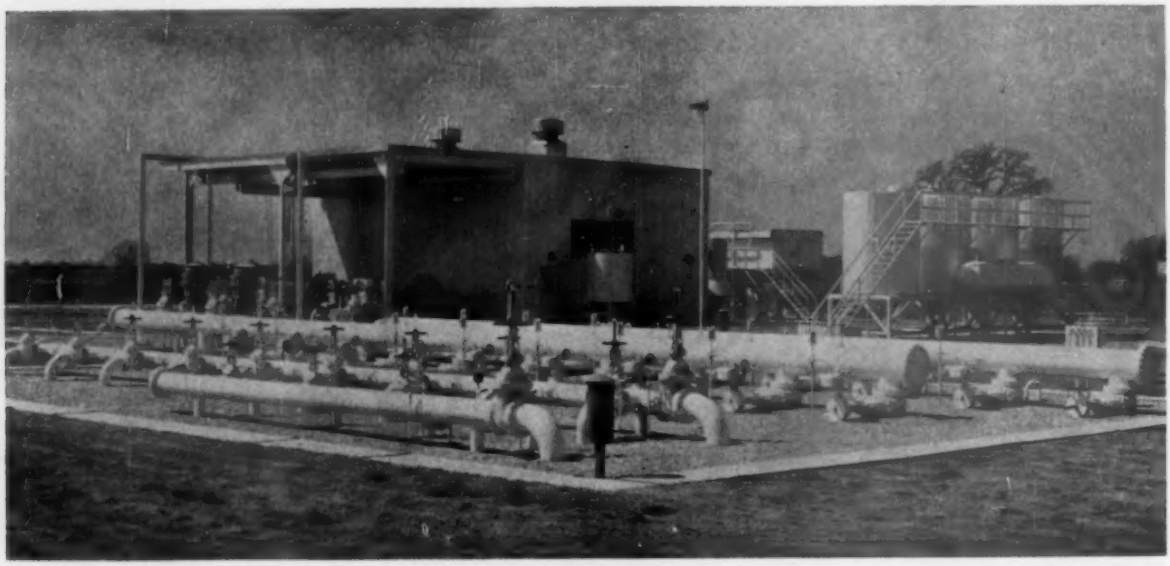


TEAGUE PUMP STATION of Sinclair Pipe Line Co., where crude is batched to refineries and tankers at Houston.

Dual-Fuel Engines Provide Economies

Two internal combustion engines are being operated by Sinclair Pipe Line Co. at its Teague (Tex.) crude pump station, where expected sudden boosts in throughput would bar use of normally favored electric motors.

The Teague station is located at the midpoint of Sinclair's crude pipeline from near Jacksboro to Houston.

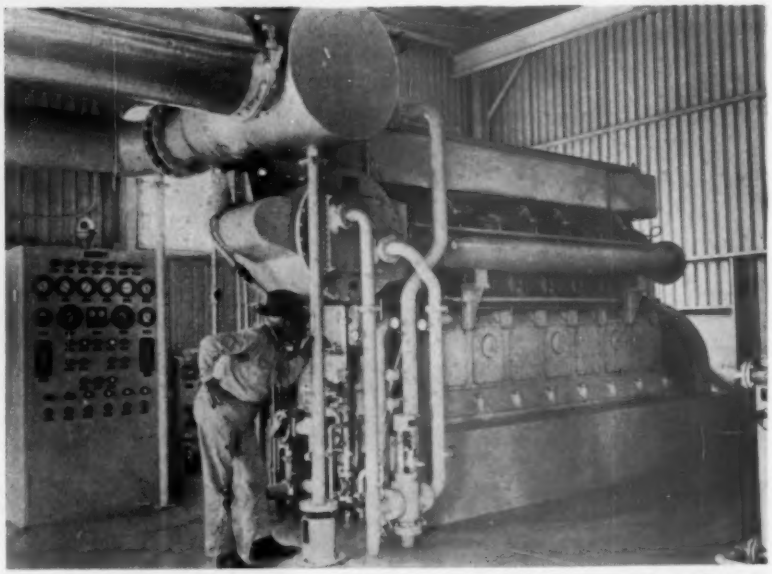
The engines are dual-fuel Supairthermal four-cycle, eight-cylinder, in-line units rated 2,000 hp. at 514 rpm. They were made by Nordberg Manufacturing Co.

The engines drive two centrifugal pumps, replacing nine small pumps.

One main-line pump operating with its engine at a full 514 rpm. can achieve a line pressure of about 720 psi. By operating the two pumps in series with engine speed reduced to 440 rpm, maximum, desired line pressure of 1,000 psi. is attained, according to Nordberg.

The engines were selected after Sinclair considered other types—including constant speed electric motors, gas turbines, and variable speed coupling-drive engines.

Performance of the engines has been rated on the basis of several thousand hours of operation.



SUPAIRTHERMAL ENGINE is one of two four-cycle, eight cylinder units at Teague.

The increases will be due to the necessity of loading additional tankers at Houston. They will occur only occasionally, but the cost per month of electric power would be based on the high rates charged at those times.

"If you have a high demand for power for just a few hours," a spokesman explains, "you pay a higher rate for the whole month."

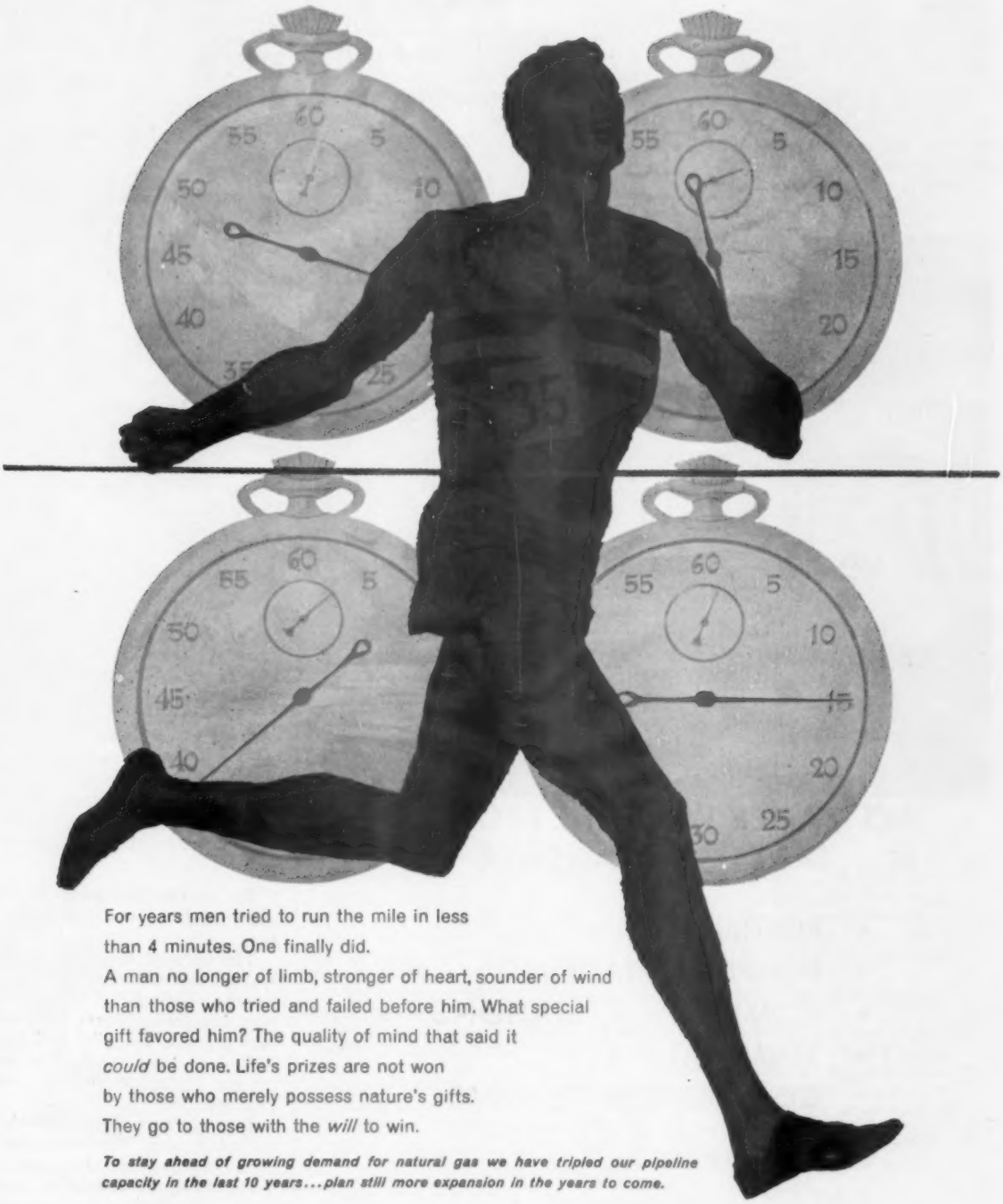
Crude is tanked at Teague, which has five 120,000-bbl. tanks and six 55,000-bbl. tanks. And then it's dispatched to Houston as it's needed.

The station is now pumping an average of 130,000 b/d to supply Houston refineries and some four or five tankers that load each month at Houston for Marcus Hook.

It's possible, however, that when additional tankers have to be loaded, the pumping rate will have to be boosted to as much as 180,000 b/d.

"At these times, when we would call upon the power company to furnish peak-load power," the spokes-

THE FOUR MINUTE MIND



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man says, "we would be penalized a lot of money." He points out that it's necessary for an electric company to charge the higher rate, because the sudden starting up of dynamos is expensive.

He adds that electrically driven motors are desirable in most other situations.

Fuel cost for the engines, which are now burning natural gas, is 0.51 mills per bbl. pumped, or 2.1 mills per horsepower-hour.

Diesel is used as a pilot fuel.

The engines can be operated with crude or diesel.

The gas is first passed through a scrubber to a common header, which would supply each engine through a governor-controlled regulating valve.

Each engine has a closed cooling-water system, which consists of a fan-cooled radiator, and electric-driven jacket water and jacket water balancing pumps.

Temperature control of the engines is automatic.

The radiator fans are driven by two-speed motors, which are automatically controlled to regulate the temperature of the water.

Thermostatic valves direct as much water as is required through the engine intercooler, engine lube oil cooler, and accessory lube system cooler.

Engine air comes through oil bath filters, then passes through an exhaust-driven turbocharger and the intercooler.

Engine controls have been arranged so that they can be operated by one man, and by remote control if Sinclair decides to install such facilities in the future.

The engines are started by an operator in the engine room.

First, lube, water, and fuel pumps are turned on. Next, a prestart button is pressed and a light comes on if cooling water, lube, and fuel pressures are up and if suction pressure to the main pipeline pump is adequate. Then the engines are started.

The engines are equipped with pneumatically operated pipeline governors and engine speed can be controlled manually from either the engine-room panel or from a nearby control building. But, normally, engine speed is regulated automatically by pipeline flow or pressure.

Controls on a main panel are set for desired volume of flow, high discharge line pressure, and low suction pressure. Then the engines run as fast as necessary to provide the indicated flow volume, but the pressure settings can override the volume control to keep suction pressure above the set minimum and discharge pressure below the prescribed maximum.

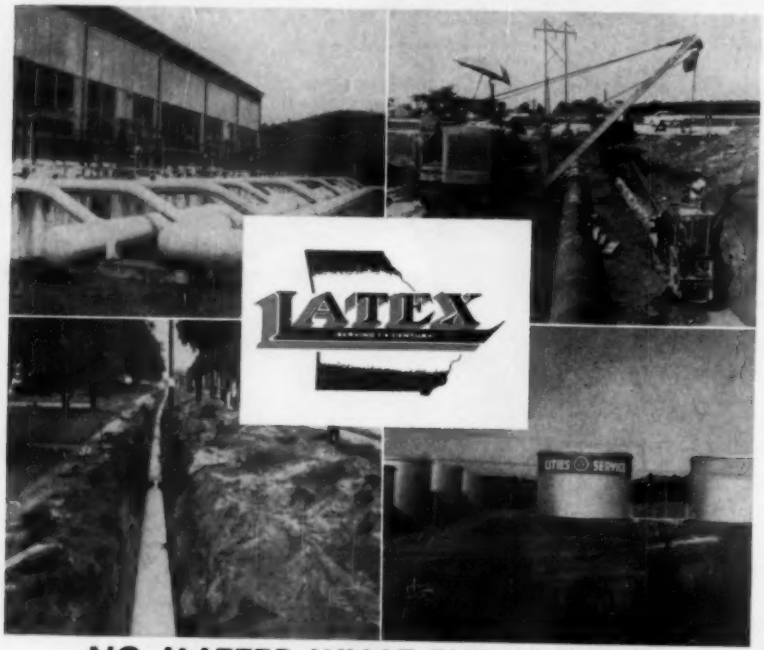
If Sinclair does switch to remote control, the station will be operated via microwave from Independence, Kan.

The station is equipped with an alarm and automatic shutdown system.

The operator is warned of the following malfunctions: excessive seal leakage, high jacket-water temperature, low lube pressure, low accessory lube pressure, low pilot fuel pressure, high lube temperature, low starting air and control air pressure, and engine overspeed.

In each case, if the trouble isn't corrected and the condition approaches a dangerous level, the engine shuts down automatically and the cause of the shutdown is indicated on an annunciator panel.

Automatic shutdown occurs in the case of low pump suction pressure, high pipeline discharge pressure, low voltage, and high temperature in a pump bearing, pump case, or speed increaser bearing.



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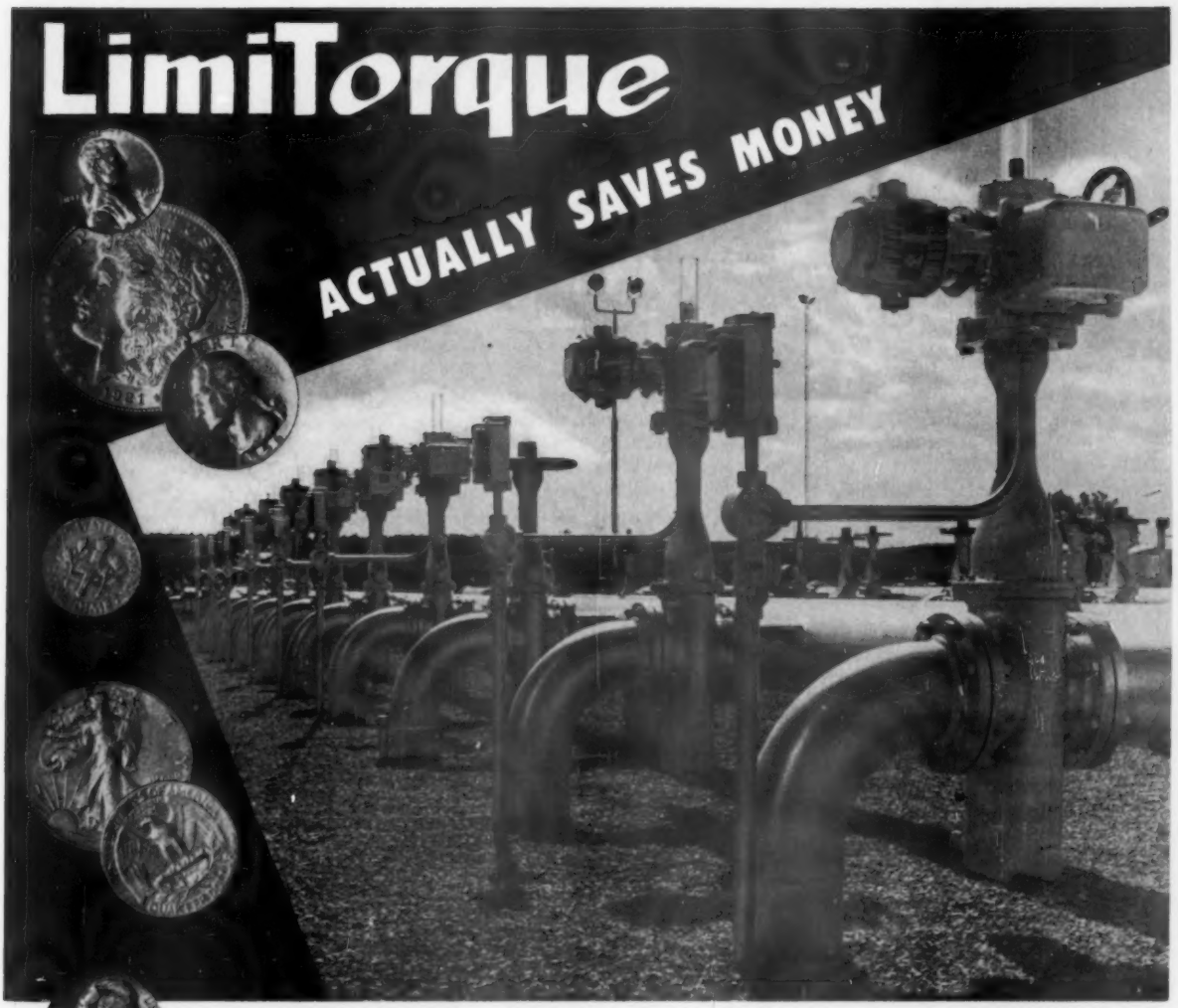

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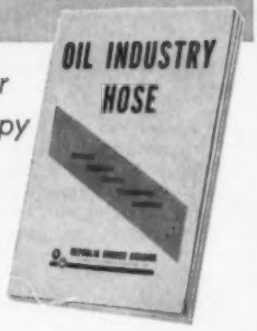

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What's New / IN TRANSPORTATION

Pacific Gas & Electric Co. and Pacific Gas Transmission Co., its subsidiary, use solid-state multiplexing equipment in the microwave system being installed on their West Coast gas pipeline (PW—Apr.21'61,p54).

The equipment is being supplied by Lynch Communication Systems, Inc., at a cost of approximately $250,000. It is designed to provide for drop-out and reinsertion of 12 or less channels of communications at intermediate stations on the line.

•

A total of $777-million worth of "major" construction projects are pending before the Federal Power Commission.

A "major" project is one that costs more than $700,000.

Of this total, projects valued at $144.5-million have been authorized and are under way under temporary certificates, while the balance of the proposals have not yet been acted on.

Applications involving another $187-million worth of construction have been returned to companies for additional information.

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Transcontinental Gas Pipe Line Corp. announces it has completed its tenth consecutive year with no personal public injuries or public property damage.

In addition, the company says, perfect employee safety records were achieved in Alabama, North Carolina, Maryland, and New York.

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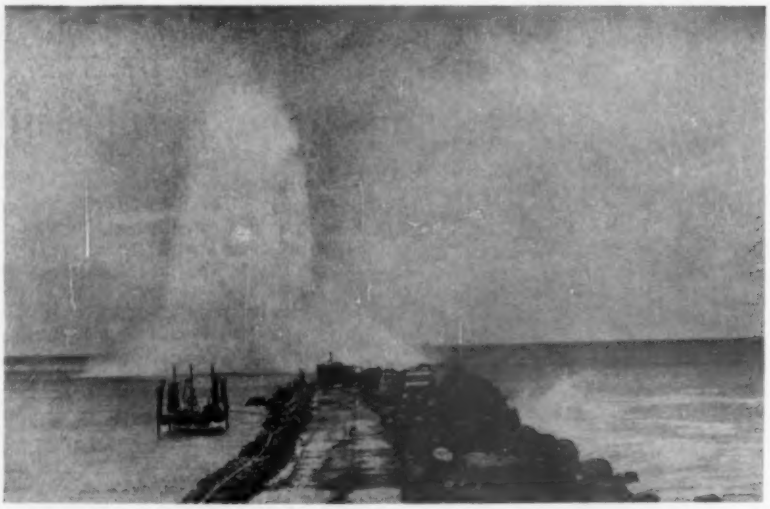
The American Gas Assn. has formed an automation committee to coordinate and expand the association's efforts in that area.

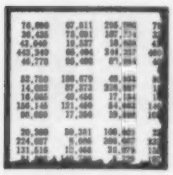
The committee will collect and distribute information about automation in the gas industry, and recommend research projects and economical applications of automation.

Neal B. LauBach, vice-president, Colorado Interstate Gas Co., has been named chairman.



Tanker Anchorage Blasted Out of Coral

The slick, hard coral bottom off Barbers Point, Oahu, Hawaii, is blasted to create trenches in which tanker anchors can grip, while the vessels unload crude for the new refinery of Standard Oil Co. of California onshore. It was decided that offshore mooring (in 70 ft. of water) would be necessary so that big tankers could be unloaded, but it was found that anchors merely slid over the skin of the coral. California Shipping Co. blasted the trenches, which are 8 ft. deep and 17 ft. wide. Stancal reports they're working well, and tankers up to 70,000 tons are mooring and delivering an average of 20,000 b/d.

The Market  Trend

PETROLEUM WEEK

May 5, 1961

Big Brother Will be Watching You

Governments increasingly are getting into the oil price act. This is perhaps the most significant trend in recent years. Call it interest, interference, obstruction—what you will—but Big Brother is looking at you.

The Common Market Authority's interest in prices is just one of many examples of government interest in oil. The Common Market Authority would like to find out what makes oil prices tick. They haven't found out yet, but you can make book on it that they will.

At home, the Dept. of Justice is showing great interest in offering prices to the government—especially if they're identical. This is in addition to Justice's normally heavy focus on retail gasoline markets.

At the government level, too, the U. S. and Mexico are trying to find an answer to what is laughingly known as the Brownsville U-turn. This involves the overland exception for foreign residual which threatens to disrupt the imports program.

Uruguay intends to have a greater say in petroleum affairs beginning next July. At that time the nation will start buying 100% of its crude requirements, instead of 50% as presently. Under five-year arrangements soon to expire, 50% of Uruguay's oil marketing is done by Esso, Shell, and Texaco, with each company supplying its own crude.

Brazil sent a trade mission to Moscow last week to work out a barter deal for the supply of oil, giving up coffee in return. In such a deal where two governments are concerned, oil companies can only stand back and hope to pick up the pieces.

With increasing stridence, the Organization of Petroleum Exporting Countries (OPEC) is demanding a price-making role in oil affairs. This noise will get louder, not softer, as time goes on.

Unfortunately, when governments move in, the marketplace tends to disappear. The spontaneity of open market trading disappears. Word-of-mouth supply contracts will be a thing of the past. Instead, there will be long-winded agendas in London, Teheran, Caracas, and points north and south.

No. 2 Oil Slips 0.5c:

No. 2 fuel slipped 0.5¢ at the Gulf last week in a seasonal move. Refiners had been asking 9¢ a gal., but buyers were playing. Offerings and sales finally took place at 8.5¢.

No. 6 Oil And Quotas:

The word in the East this week is that a No. 6 oil "ticket" is worth about 40¢ a bbl., per day.

The whys and wherefores of this price are as follows: $1.65 in the Caribbean, 20¢ freight, 5.25¢ duty—and you get the difference from $2.25, the delivered contract price at New York.

The Market Place

AROUND THE WORLD

Current key crude and product prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service, a McGraw-Hill Publication.

All prices as of May 1

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U.S. Gulf Coast, cargoes
- Gasoline, 98 oct prem....11.75-13.25
- Gasoline, 92 oct reg....10.75-11.5
- Kerosine....9.625-10.75
- **Heating oil, No. 2....8.5↓-10**
- **Gas oil, 48-52, d.i....8.75↓-9.75**
- Fuel oil, bunker "C"....$2.20-2.40

Caribbean, cargoes
- Avgas, Grade 100/130....14.75
- **Gasoline, 93 oct research prem..10.625↓-10.875**
- **Gasoline, 87 oct research reg....9.125↓-9.5**
- **Gasoline, 80 oct research....8.25↓-8.75**
- Kerosine....9.875
- Heating oil, No. 2....8.625
- Gas oil, 48-52 d.i....8.875
- Fuel oil, bunker "C"....$2.00

New York Harbor, barges
- **Kerosine....10.45↓-11.4**
- **Heating oil, No. 2....9.45↓-10.4**
- Fuel oil, No. 6....$2.62

Okla.-Group 3, northern shpt., bulk
- Gasoline, 91 oct reg....12.5-13.25
- Kerosine....10.125-10.625
- Heating oil, No. 2....8.75-9.25
- Fuel oil, No. 6....$1.60-1.90

Chicago, bulk
- Gasoline, 92 oct reg....11.5
- Heating oil, No. 2....9.25-11.35
- Fuel oil, No. 6 high sulfur....7.4

Los Angeles, rack
- Gasoline, 88 oct reg....10.8-12.65
- Diesel fuel, PS 200....7.75-11.25
- Light fuel, PS 300....$2.90
- Heavy fuel, PS 400....$2.10-2.45

Natural Gasoline, Grade 26-70
- FOB Group 3....4.5
- FOB Breckenridge, Tex....4

LP-Gas
- Propane, Oklahoma (Group 3)....3.5-4
- Propane, Baton Rouge....4.625

Pennsylvania Lubes
- Bright stock, 25 p.t....26
- 200 vis. neutral, 25 p.t....28

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 v.i....26-27
- Neutral solvent, 200-210 vis....23-24

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i....26-27
- Neutral, solvent, 200 vis....23-24

Eastern Hemisphere

Singapore (Pulau Bukom) cargoes
- Avgas, grade 100/130....15.75
- Gasoline, 79 oct research....9
- Kerosine....9.75
- Gas oil, 48 d.i. minimum....9

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, (Okla.-Kan.), 36.0-36.9....$2.69-2.97
- North Dakota, 36.0-36.9....2.47-2.87
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9....3.50
  - Gulf Coast, Upper & Lower, 26.0-26.9....2.92-3.22
  - West Texas, sweet, 36.0-36.9....3.00
  - West Texas, N.M., inter., 36.0-36.9....2.93
  - West Texas, N.M., sour, 32.0-32.9....2.71-2.85
  - East Texas, flat....3.05-3.25
  - Mirando, 28.0-28.9....2.96-3.31
- Illinois Basin, flat....3.00
- Pennsylvania Grade, Bradford dist., flat....4.80
- California, Signal Hill, 21.0-21.9....2.33†
- North Louisiana-Arkansas, 36.0-36.9....2.72-3.02
- Wyoming, sweet, 36.0-36.9....2.85-2.90
- Wyoming, sour, 32.0-32.9....2.63-2.71

Canada (flat prices, at the well)
- Pembina (Alta.)....$2.38
- Leduc-Woodbend (Alta.)....2.53
- Redwater (Alta.)....2.42
- Steelman A (Sask.)....2.425
- Virden (Man.)....2.285

Venezuela (Cargoes, FOB lifting port designated)
- San Joaquin, 41.0-41.9, Puerto la Cruz....$3.10
- Oficina, 35.0-35.9, Puerto la Cruz....2.80
- Tia Juana, Medium, 26.0-26.9, Amuay....2.30
- Bachaquero, flat, La Salina....1.85
- Lagomar, 31.0-31.9, Cardon....2.55
- Lagunillas Heavy, flat, La Salina....2.07

†Differential per deg. of grav. varies

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura....$1.80
- Safaniya, 27.0-27.9, Ras Tanura....1.47
- Iran, 34.0-34.9, Bandar Mashur....1.78
- Iran, 34.0-34.9, Abadan....1.73
- Iraq, 35.0-35.9, Fao....1.72
- Kuwait, 31.0-31.9, Mina-al-Ahmadi....1.59
- Qatar, 41.0-41.9, Umm Said....1.95
- N. Zone, Burghan, 23.5-24.4, Mina Saud....1.48
- N. Zone, Ratawi, 23.5-24.4, Mina Saud....1.41
- N. Zone, Eocene, 16.5-17.4, Mina Saud....1.28

Middle East, Eastern Mediterranean
- Arabia, 34.0-34.9, Sidon....$2.17
- Iraq, 36.0-36.9, Tripoli, Banias....2.21

North Africa, Bougie, Algeria
- Hassi Messaoud, 40 and above....$2.65

KEY TANKER RATES

(Last paid, per long ton, single voyage)

- **U.S. Gulf-New York, clean ..(ATRS—30%) $2.00↓**
- **U.S. Gulf-New York, dirty (ATRS—27½%) $2.07↑**
- NWI-USNH, dirty....(ATRS—60%) $1.10
- **NWI-UK/Cont., dirty....(Scale—65%) 11/6*↓**
- **Persian Gulf-UK/Cont., dirty .(Scale—76%) 18*↓**
- Persian Gulf-USNH, dirty....(USMC—80%) $2.54

**Sterling*

Service Station Attendants Found Caught in a Cross-Fire of Abuse

Dealers carp at them for their laziness. Motorists show them no respect. But what's missing, a new survey shows, is a lack of understanding from the dealer.

A serious breakdown in the relationship between dealers and their attendants has been brought to light in a new nationwide survey by Dow Chemical Co.

The findings uncovered by Dow may have broad significance. For in running service stations, dealers are limited in what they can perform themselves. They must rely on their attendants to fill the job of serving the public.

But Dow has found that, instead of vigorous, all-out cooperation, dealers and attendants often suffer mutual disappointment and resentment.

Service stations, as a result, have become infected with an atmosphere of drudgery and bitterness.

Dow's survey, entitled "a motivation study of the factors of morale among service station personnel," is derived from depth interviews conducted at 153 service stations (in 24 states) by Social Attitude Survey, Inc., Yonkers, N. Y.

From the dealer's point-of-view, Dow discovered, the problem is centered on the attendants' general lack of initiative. "They're just plain lazy," is the way one dealer puts it.

"They're uneducated and incompetent," another dealer adds, "Can't get a job anywhere else."

When attendants first come to work for a dealer, the impression they make may not always be bad. Actually they may show enthusiasm and interest.

But after a month or so, "they get too independent; they think they know the whole business, so they want a raise," one dealer finds.

"I can't afford to pay more for better men, not with the low margin on gas the oil companies give you," another dealer complains.

From here on, Dow records, the dealer-attendant relationship lapses into sullenness and disrespect.

But the laziness, clock-watching, and demands for more pay that dealers decry are not the central causes of the problem.

"They are, rather, the outward signs of the trouble symptoms, not the causes," says Dow.

The true cause of the problem is that the attendant is a man with hurt pride. He believes the public looks down on his job, Dow says.

His self-image is that of a man unjustly cowering at the bottom rung of society—without status and regard.

Right or wrong, Dow says, attendants sense that their jobs are scorned by the people they serve.

"As far as the public is concerned, service station attendants are laborers, and one of the lowest forms of occupation," an attendant in Chicago, observes.

But neither the dealer nor the attendant realizes, Dow says, "that a large part of the trouble between them starts, not in them directly, but rather from the attendant's conceptions of the pervading attitude in our culture towards the job of attendant."

The attendant's self-image, nevertheless, puts a damper on his enthusiasm for his work. And when a dealer orders him to mop up a grease stain or reminds him to wipe a windshield, the degradation of his position in life "stares him in the face," Dow shows.

Laboring under self-contempt, the attendant is liable to be temperamental, peevish, and truculent.

Not recognizing the reasons for this behavior, dealers are likely to assert: "You gotta show them who's boss or they get out of hand."

The dealer himself, however, is also likely to suffer from misgivings about his own lack of social status.

Through depth interviews, Dow found that dealers, like their men, consider themselves to be low on the social scale.

Their lowliness does not, however, induce them to strive upwards.

Rather than seek the company of oil men in a higher status, for example, they would turn to attendants or men in their own rank.

But dealers and attendants, not realizing that they need each other for

mutual support, constantly impugn each other until their relationship degenerates into a lassitude that even motorists will feel.

Often, the dealer's own self-consciousness hinders him in his efforts to sell to his customers.

On meeting the public, he hesitates. He cannot bring himself to make a sale. "The dealer fears that active selling will be misunderstood by the public as pushing more on them than they need," Dow explains.

This fear, however, prevents them from showing their men how to sell.

And yet, despite this failure to train attendants, dealers will carp at their men for their inability to sell—"as if they had a built-in demon that purposely prevents them selling," says Dow.

In looking for a solution to the disharmony that interferes with smooth service station operation, Dow has selected what it feels to be the primary factor—the lack of closeness between a dealer and his men.

A knowledgeable dealer in New York struck at this central point when he told Dow that "the important thing in a service station is to get them [the attendants] to feel it's not a degraded job and that they're important to me."

When an attendant is close to his dealer, he can identify his problems as his own, Dow adds. The dealer's aspirations become the attendant's.

To illustrate the harmony that can arise from such an identification, Dow points to a Minneapolis attendant.

"My boss respects me and I respect him," the attendant remarks. "Yes, I am his employee, but he is interested in helping me get along. He trusts me with most anything . . . We are all interested in seeing Bill make a success of his business."

Dow calls for a "redirection" of the dealers' attitude toward their employees.

Oil companies, Dow notes, "could probably do much to better the situation by sensitizing the dealer to the internal social relations in his station."

In addition, Dow suggests that oil companies might do well to try to develop closer ties with attendants. On-the-job training might help here, as long as the oil company does not try to displace the dealer as the key man at the station.

Finally, Dow calls for a public relations effort to raise the public's estimation of the attendant's status. "Indirectly, the very effort itself would probably enhance the attendant's own self-confidence."

What's New / IN MARKETING

Oil-heat promotion has long been a local affair. But the time has come to consider a national advertising campaign, says Glenn L. Werly, president of the newly formed National Oil Fuel Institute.

What Werly has in mind is a coast-to-coast umbrella that can be held over the local programs, giving them national reinforcement without destroying their flexibility.

With such a program, Werly says, "We will aim at adding another barrel to our promotional rifle. We will spend our money and effort on getting across the strong story of our product rather than in confusing the issue and leaving the consumer confused."

But Werly would brook no unfair advertising from competitors: "Where our product is exposed to unfair advertising, we know and will use proper public relations methods to stop it," he said.

Werly spoke last week before the members of the Oil Heat Institute of America, the unit that has merged with the National Fueloil Council to form the National Oil Fuel Institute.

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Machines that dispense life insurance for a dollar will soon appear at service stations in the West. But in the Midwest, motorists can get accident insurance without paying anything.

Tidewater Oil Co. plans to introduce insurance dispensing machines at its stations on the West Coast. A $1 premium will provide $7,500 worth of death and dismemberment insurance, plus $500 in medical and hospital expenses, good for one week.

Meanwhile, Tresler Oil Co., a Cincinnati jobber, is offering its credit-card customers a $2,500 accident insurance policy absolutely free.

But to keep the insurance from expiring, participating motorists must charge at least $10 a month at Tresler service stations (not counting repairs) —and pay their bills every 30 days.

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An oil-heat equipment manufacturer issued an appeal last week for more uniform oil quality. He suggested that the present No. 2 and No. 5 fuel oils each be subdivided into supplementary classifications.

R. C. Wright, engineering vice-president at Iron Fireman Manufacturing Co., spoke to oil jobbers at the Oil Heat Institute of America, which held its annual meeting in Washington last week.

Wright decried the present broad classification of No. 2 oil, which ranges from a minimum API gravity of 26 to as high as 45 gravity.

"To realize the full potential of new and greatly improved burning systems," Wright said, "will require fuel uniformity."

Alluding to the strict uniform quality of electricity, he called for a "60-cycle" oil. For practical purposes, however, he suggested two No. 2 classifications: One ranging between 33 to 37 API gravity and another for heavier grades between 27 and 31 gravity.

No. 5 oil, which is now so broad in quality it limits the value of standard specifications, Wright said, should also be subdivided.

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The octane level of premium gasoline averaged 99.3-octane last month, and regular averaged 92.6-octane.

Except for a 0.1-octane fluctuation in regular last fall, both ratings have remained unchanged since August, 1960, according to Ethyl Corp.

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In Santa Clara county, California, the crackdown on so-called "variety store" service stations is proving effective. The crackdown, aimed at service stations that clutter their driveways with merchandising displays of nonpetroleum products, began last year when the county planning commission prohibited such displays at new stations (PW—Dec.2'60,p68).

Two "variety store" stations that had been planned are now being modified in accordance with the ruling, and no new permits for such stations have been applied for.

Outdoor displays at older stations, where the ruling does not apply, have also started to disappear.

Whether or not the ruling is the motivating force is a moot question in Santa Clara. Public opinion had become so strongly opposed to the stations that some dealers admit they would have brought their displays inside anyway.

Best place for them, dealers find, is in converted lube bays left idle by a decline in grease jobs.

Competing with service station dealers coast to coast, Atlantic dealer Charles Lott, Moorestown, New Jersey, named "Retailer of the Year" by Brand Names Foundation, Inc.

Atlantic dealer wins highest Brand Names Award

Mr. Charles Lott of Moorestown, New Jersey, was named "Gasoline Retailer of the Year" by Brand Names Foundation, Inc. The competition was open to service station dealers throughout the United States.

As a businessman, Mr. Lott has built up the reputation of his station by offering his customers quality products and dependable service. In addition to this, he is a civic-minded citizen who sponsors and actively participates in desirable community projects. A sound knowledge of his business and a real desire to serve his community have earned him the impressive Brand Names tribute.

Mr. Lott is the sixth Atlantic dealer since 1952 to win the Brand Names First Award. For the last three years, Atlantic dealers have placed first in this important competition. Over-all, 21 Atlantic dealers have won recognition by being named among the top five winners.

The Atlantic Refining Company is justifiably proud of Charles Lott. To us, he is a symbol of over 8500 independent business men – Atlantic dealers from New England to Florida. These are the men who stand behind the familiar Atlantic sign ... the men who bring life to the words "Atlantic keeps your car on the go."

For the third straight year, Cuyahoga Falls, Ohio, Atlantic dealer Ellsworth Frazier was named among the top five winners in national Brand Names competition.

THE ATLANTIC REFINING COMPANY

Producer, refiner and marketer of quality petroleum products

CONFIDENCE BRAND NAMES SATISFACTION

REG. PENDING

Creole Plans Large-Scale Waterflood

In first such project on Lake Maracaibo the firm will also use gas injection for "sandwich" drive

CARACAS—Creole Petroleum Corp. is planning an outsized waterflood project in its big LL-5 reservoir in Lake Maracaibo—the first full-scale waterflood in the oil-rich lake.

The project is designed to halt pressure decline and to maintain uniform pressure distribution in the reservoir. Also, the company expects the project will help it to achieve uniform pressure distribution more quickly.

The waterflood will be combined with gas injection to set up a "sandwich" drive.

Creole expects to pump 300,000 b/d of water through eight injection wells into the aquifer on the broad lower flank of the roughly pie-shaped pool.

At the upper end—5 to 9 mi. away Creole is already injecting up to 250-million cf/d of gas through three wells into the reservoir's secondary gas cap.

The waterflood is expected to increase ultimate recovery by 170-million bbl. above the estimated recovery for gas injection alone.

This is equivalent to 4% of the oil originally in place—about 4.5 billion bbl. LL-5 covering some 25,000 acres, one of the biggest reservoirs in the lake.

The reservoir currently produces about 130,000 b/d of 24-25-degree crude from some 220 wells. The producing zone, the Lower Lagunillas, is a lenticular sand of Miocene age. Net thicknesses of the producing zone is about 100 ft.

The reservoir dips at an angle of 2.7%, and the water-injection zone on the lower flank is at a depth of 4,700 ft.

A pilot well for the flood has already injected nearly 12-million bbl. of water at rates up to 40,000 b/d.

In addition to a check on injection rates, the pilot well was used to determine pressures and the degree of water treatment necessary.

Because of the simplicity of the planned water treatment, Creole studies have shown that it will be cheaper to operate the wells as independent units than to install a central water pumping plant in the lake or onshore.

Each well will be equipped with an electric motor—tentatively rated at 1,600 hp.—for pumping. Injection tubing will be 7 in. in diameter.

Eight injection wells will pump in raw lake water—unfiltered and treated only for air removal.

Removal of air will be accomplished by counter-flowing natural gas through the water in vertical tanks mounted on the well platforms. The gas saturates the water, forcing the air out.

Salinity in the water is 2,000 parts per million or less. Thus, a calcium chloride treatment that Creole experimented with in the pilot flood was considered unnecessary.

Creole plans to fracture formations around the injection wells to eliminate any problems of water solids plugging formations.

At the outset, each water well may inject up to 50,000 b/d, but the rate will be reduced to 40,000 b/d when pressure is stabilized.

The present gas injection rate of up to 250-million cf/d will be reduced to 100 million cf/d. under stable operations.

When pressure does become stable, the excess gas injection capacity of the two lake plants will be used for pressure maintenance in other reservoirs in the Tia Juana area.

If the present project is successful, Creole expects to carry out other waterfloods in the lake. The company is now convinced water-flooding is comparable in efficiency to gas injection and considerably cheaper.

With Output Drop Expected, Gabon Search Will Go Offshore

An extensive offshore drilling program will be begun next August by Mobil and its French partner, Spafe.

The first wildcat on the offshore Mobil-Spafe acreage will be 5 mi. out at sea, off Ekueta, in an area that has been pinpointed as promising by geophysical studies.

Offshore Drilling Co. of Baton Rouge, La., will supply the drilling barge and act as contractor for the 16-month campaign. Three-fifths of that time will be spent exploring joint Spafe-Mobil acreage, and the remaining time on offshore tracts held solely by Spafe.

The joint offshore program will begin at a time when production from Spafe's wholly owned onshore fields is beginning to sag. This production makes up all but a minute part of Gabon's total output.

Spafe engineers estimate that production in Gabon will drop to from 15,000 to 16,000 b/d this year, from a peak of 17,040 b/d last year.

On both offshore and some onshore tracts, Spafe is participating in a joint venture with Mobil. But only small quantities of oil have been produced on these. Spafe is also in partnership with Shell on other acreage, where exploration has yet to begin.

The expected drop in Gabon production is not worrying Spafe technicians.

They say that the type of small field Spafe has developed in Gabon has a productive life of from 10 to 12 years. After two or three years of maximum production, a decline is normal.

After rising steadily since the start of production in 1957, output from Gabon reached a peak of 17,040 b/d last year. It is expected to dwindle to 15,000 or 16,000 b/d this year.

Spafe does not expect either Gabon or the neighboring Congo Republic ever to be big oil producers. (The latter area is a former French territory, not the new nation that was once the Belgian Congo.)

Spafe hopes, however, to turn up more fields like the small ones it already has. If the company is lucky, it says, the two countries may some day produce 60,000 b/d together.

At the moment, however, 20,000 b/d looks like a more reasonable guess for the near future.

Spafe won't say how close it is to the breakeven point, but admits production doesn't yet cover costs.

Investments are planned at $18.9-million this year compared to $19.1-million in 1960. They are now covered

in part by crude oil sales. The remainder comes from financial participation by Spafe's international partners, Mobil and Shell.

Gabon crude is sold in France, mainly to big international groups. Big clients last year were Shell, which bought 3,200 b/d, British Petroleum, 3,400 b/d, and Mobil, 4,800 b/d. Antar, a French refiner, bought 3,600 b/d.

Contracts for 1961 call for sales of 3,000 b/d to Shell, 3,000 b/d to British Petroleum, 8,000 b/d to Mobil, and 2,000 b/d to Cie. Francaise des Petroles.

Eventually, some of Spafe's Gabon and Congo production may be refined in Africa—at Dakar, Senegal. The Atlantic Ocean bunkering port is being considered as the site for an African refinery. But a commercial discovery in Senegal would be needed to give real impetus to the project, which has been gathering dust in the files of a French oil agency for two years.

In addition to its offshore search, Spafe plans to continue Gabon onshore exploration with two rigs this year. Three geophysical teams will continue work on the Spafe-Shell acreage, preparatory to drilling a first wildcat there around the end of 1962. Up to now, difficult formations have slowed geophysical work.

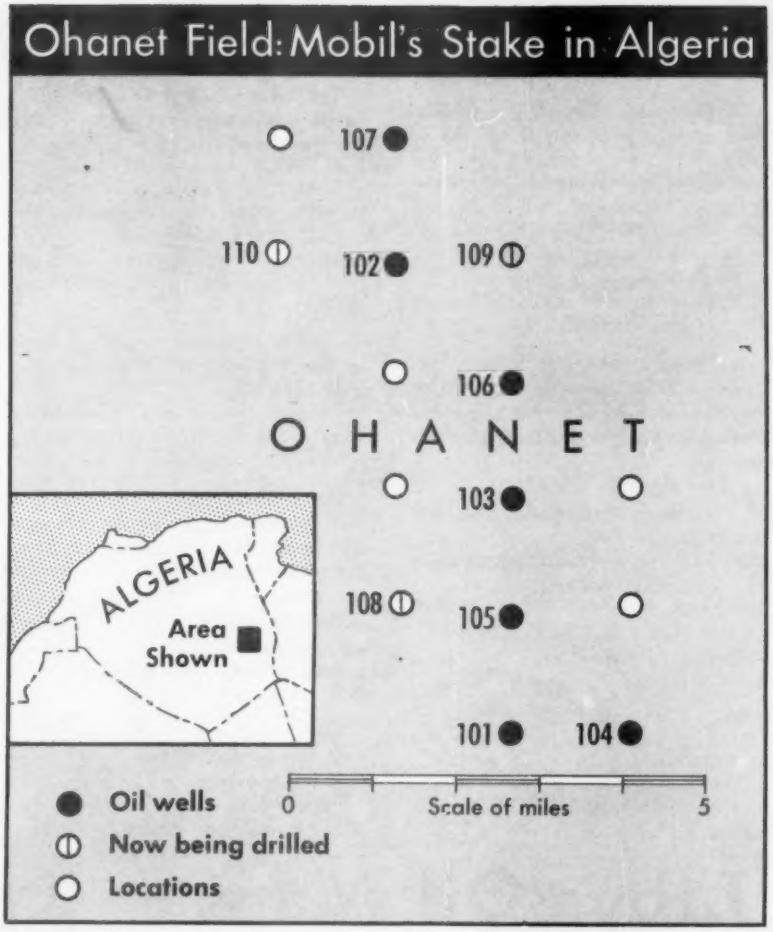
Most attention this year will be given to a promising structure uncovered last year by Spafe and Mobil at Batanga, in the Fernan Vaz region. Two small producers have been completed on the structure, and a third hole is now being drilled.

Libya Firms Have High Find Rate

Libyan oil operators have maintained a high batting average—better than one oil well for each three holes drilled, Libyan Petroleum Commission statistics showed last week.

Oil companies have drilled or were in the process of drilling 242 holes as of Apr. 1. Of these, 87 had been completed as oil producers.

Total test rate of all oil wells completed by Apr. 1 was 150,704 b/d. Not all of the discoveries have been commercial, however.



Mobil Will Share in 30,000 b/d From Sahara's Ohanet Field

This year, Mobil will become the first U.S. company with a producing stake in the Algerian Sahara—through its 25% share in the Ohanet field in eastern Algeria.

The field, developed by the French company, Cie. d'Exploration Petroliere, will go into production upon completion of a pipeline.

CEP owns 38% of the field. The remaining shares are held by the French firms Francarep (13%), Euraf-rep (11%), Coparex (9%), and Amif (4%).

While the Ohanet field will not likely become one of Algeria's largest, it is expected to produce at the rate of 30,000 b/d by the end of this year.

That is the estimate made by engineers for the French operators recently.

This production level is far below the more than 200,000 b/d figure for Hassi Messaoud. But it is roughly comparable to the expected rates from some of the smaller fields south of Ohanet.

The Ohanet structure is some 6-mi. long by 2-mi. wide. It lies not far from the Libyan border.

The operators eventually plan to complete about 25 producers in Ohanet field.

At present, seven oil wells have been completed since the discovery was made a year ago. Test rates have ranged up to 2,000 b/d.

Recoverable reserves of the field have been estimated at at least 180-million bbls. by CEP.

The estimate is only for the CEP-Mobil share of the structure. It is believed the Ohanet reservoir extends southward into a concession held by Creops, in which the Shell group holds a 35% interest.

While development work in the

Creps' offset area has not gone very far, preliminary estimates put recoverable reserves there at 85-million bbl.

While production from Ohanet field may be relatively small, the oil produced there has one big advantage—"built-in market" in France.

France has pushed hard in the past few years to develop its Sahara fields in an effort to become self-sufficient so far as oil supply is concerned.

The primary market for all Saharan oil is Metropolitan France.

Preliminary work has already begun on a 275-mi. pipeline that will link the Ohanet field with the big Hassi Messaoud field and its offtake system.

From there, the oil will be carried via a 24-in. pipeline to the Mediterranean port of Bougie.

In addition, work has been started on a gathering system at the Ohanet base camp.

More than 25-mi. of 3-in. and 4-in. pipe for gathering lines has been shipped to the area and the foundations of four storage tanks each with 35,000 bbl. capacity have been laid up to now.

The Batanga find is the first important one for the Spafe-Mobil partnership so far.

Aramco Aide Warns on Prices

The oil producing nations' efforts to fix prices are doomed to failure, the general counsel of Arabian American Oil Co. warned last week.

George W. Ray Jr. made the statement in a speech called "Some Reasons for the Binding Force of Development Contracts Between States and Foreign Nationals," at the University of Texas Law School.

"The truth is that prices are made in the market place," the Aramco aide said.

"And the buyer has as much to say about what the price will be as the seller," he continued.

He added that price reductions such as those made on Middle East oil last summer did not always lower the total revenue of the governments concerned.

Rather, he continued, "a price cut can and usually may hold the line or actually increase total sales, and hence the state's total revenues."

Price-making is "the most important managerial and customer function in any enterprise," he said.

"Price makers should be free of all political pressures, a freedom impossible of attainment by the politician . . . States would be wise to leave such matters to those who are best equipped to handle them."

The Aramco official also declared that nations do not have the right to alter or abrogate oil concessions unilaterally.

"I say emphatically," Ray declared, "that there is no such thing in law as a sovereign right which gives to any state a legal justification for getting any individual or company to risk its capital and to use its skill in finding a natural resource and, upon finding it, to develop it, and then, when the arrangement turns out well for all concerned, either to set the arrangement aside or to force its continuance under altered terms.

"Any state claiming such a right and endeavoring to exercise it will find to its sorrow that loss rather than profit will follow. It will lose its reputation for keeping its promises, and with that loss will lose many of its customers."

The Aramco aide said that Middle East statemen are not among those who call for unilaterial alteration of contracts.

Libya Oil Maps

Jack Ammann, Inc., has geological maps of Libya, immediately available to assist you in locating concession areas of the most promise in this vital region.

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But there's still time to be well informed on the whole oil industry—with Petroleum Week's variable-speed reading

When you're in a real hurry and want a quick run-down of what's going on in the industry, just scan the bold-face type in each article. This gives you the essential facts and main points of interest in fast-reading capsule form.

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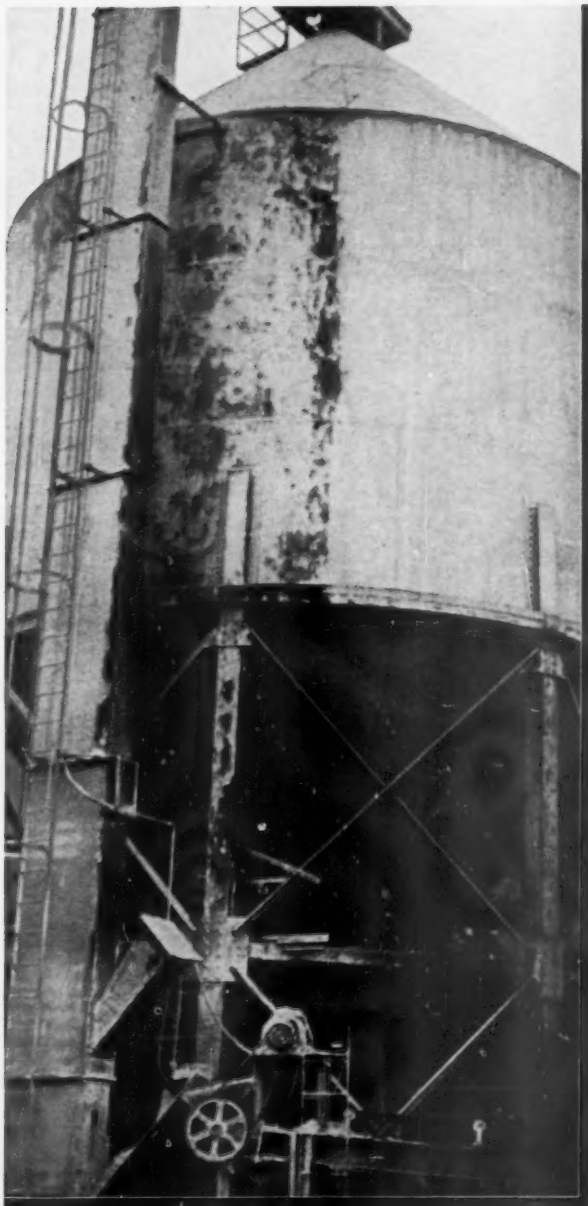
This variable-speed reading technique was pioneered by Petroleum Week to save time for busy oil men.

It enables you to get the industry-wide information you want and need, more quickly and easily than was ever possible before.



New Defense Against Corrosion

(and Mounting Maintenance Costs!)

Du Pont CORLAR(T.M.) Epoxy Enamels Afford Excellent Resistance to Chemical Spills and Fumes, Moisture and Heat up to 400° F.

Now a new kind of protective finish can help you solve *difficult* corrosion problems—and hold down skyrocketing maintenance costs. CORLAR Epoxy Chemical-Resistant Enamels combine excellent resistance to atmospheres containing mineral acids, alkalies, strong aromatic and aliphatic solvents with remarkable adhesion and heat resistance. They're also easy to handle, weather well, remain flexible at low temperatures.

Key to the success of these new coatings is a polyamide activator that binds molecules into a hard, firm film that literally *locks out* corrosion. Amide activator also makes CORLAR finishes safer to use and more stable; gives them 10-15 times longer pot life than amine types. Moreover, the epoxy resin's outstanding adhesion helps coatings stand off deterioration for years.

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For prolonged exposure to severe mineral and organic acids, use Du Pont IMLAR(T.M.) vinyl coatings. See your local Du Pont sales representative for expert technical help. For more detailed information on these new finishes, clip and mail the coupon *today*.

Tested and proven on the job. After three years of continual exposure to corrosive fumes, moisture and salt spray, CORLAR coating on right side of lime tank is still in good condition. Commonly used phenolic resin coating on left side, however, has deteriorated completely—permitting rust and corrosion to take over.

CORLAR(T.M.)

Epoxy Chemical-Resistant Enamels

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Finishes Division, Department PW-15
Wilmington 98, Delaware

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What's New / AROUND THE WORLD

TURKEY—Mobil has made a dry hole agreement with the state-owned Turkish Petroleum Co. for a wildcat now being drilled by the latter firm.

The test is going down near Batman in eastern Turkey not far from a common boundary between a Mobil concession and one held by the Turkish company. Mobil has agreed to pay $7 per foot drilled, but not more than $40,000 in all.

•

SOVIET UNION—The Soviets claim to have developed a drilling bit that can be changed without raising the drill pipe from the hole.

According to the Moscow Institute of the Oil and Gas Industry, the bit components are lowered into the hole and assembled automatically at the lower end of the drilling column.

•

IRAN—The consortium has spudded two new wildcats, one on the Island of Sheikh Shoeib in the Persian Gulf and the other at Gach Saran. This latter test is scheduled to go to 10,000 ft.

•

WEST GERMANY—Three German refiners expect to run almost 24,000 b/d of crude from French-controlled Sahara producers during 1961.

The three refiners and their expected runs of Sahara crude are British Petroleum's Dinslaken, 9,450 b/d; Shell's Godord, 9,870 b/d, and Deutsche Erdoel's Heide, 4,200 b/d. The light Sahara crude is well suited to the German market where gasoline consumption is steadily rising.

•

FRANCE—The franc zone produced 42% of the crude delivered to refineries in Metropolitan France during March.

Approximately 242,000 b/d of the 576,000 b/d in crude deliveries was produced in France itself, the Sahara or in Gabon, or the Congo Republic in West Africa. The largest source of crude was the Middle East, which supplied 54%.

•

SOVIET UNION—The Soviet Union claims it leads the world in potential natural gas reserves—accounting for 38% of the total compared with the U.S.'s 18%.

Natural gas accounted for 10.3% of the total fuel consumed here last year, compared with 5.5% in 1958 when the present seven year plan started.

•

SOUTH WEST AFRICA—Texas Eastern Transmission Co. will intensify its exploration activities in South West Africa, beginning with an aerial magnetometer survey.

The company reported a geological survey showed a large portion of its 56-million-acre concession, held through a subsidiary called Etosha Petroleum, lies in a basin of marine deposits.

•

EGYPT—A joint Italian-Belgian-Egyptian company has announced a 1,900 b/d oil discovery in the Gulf of Suez—the first offshore discovery in that area.

Cie. Oriental des Petroles d'Egypt said the gravity of the crude was 31 degrees. The pay zone was at 7,870 ft. below sea level.

Cope is owned by the Egyptian government and International Egyptian Oil Co., in which the Belgian firm Petrofina and the Italian state-owned ENI group are the major shareholders.

•

AUSTRALIA—Union Oil of California says it is too early to tell whether it has a commercial crude discovery in its Queensland wildcat.

Queensland's Minister for Mines described the find as "encouraging," and said the well was flowing at a rate of 90 to 100 b/d, stirring hopes that it may establish Australia's first commercial production.

Union says it is continuing tests in the wildcat, drilled under a joint venture with an Australian firm and Kern County Land Co., of California.

•

JAPAN—Tidewater's 50%-owned Japanese affiliate has boosted its refining capacity to 101,400 b/d with dedication this week of a new 40,000 b/d plant at Mizushima.

The company, Mitsubishi Oil, also has a 41,000 b/d refinery at Kawasaki.

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Eastman Gasoline Additives

Tenamene 1
An aminophenol. Low cost, efficient gum inhibitor for motor fuel.

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A phenylenediamine. A versatile gum inhibitor for motor fuels and aviation gasolines. Also acts as a sweetening agent in many catalytically cracked stocks.

Tenamene 3
An alkylated phenol. Efficient gum inhibitor for motor fuels, aviation gasolines and jet fuels.

Tenamene 60
A powerful copper deactivator.

Tenamene MD 50
A freeze-resistant solution containing copper deactivator.

For information on how to use Tenamene gasoline additives, send for Bulletin I-106.

For properties and shipping information on these and other Eastman products, see **Chemical Materials Catalog,** page 363, or **Chemical Week Buyers' Guide,** page 107.

Eastman

"A trunkful of gasoline inhibitor..."

"That's what he said," reports one of our sales representatives, "trunkful. And after removing fishing gear, debris from last year's vacation, plus my spare tire, that's what he got, in the form of two drums of Tenamene 3.

"The first part of the purchasing agent's late evening call was a soliloquy on the aberrations of suppliers in general. I agreed that a supplier who confused ditertiary butyl_____ (name withheld to protect the innocent) with ditertiary butyl cresol (Tenamene 3*) was a bit loose in the order-writing department. At the same time I was quietly glad that we do not sell the ditertiary butyl derivative of _____. It can happen, you know.

"Anyway that's what had happened. When they were ready to stabilize a run of aviation gasoline, a sharp foreman stopped the operation before the gasoline was adulterated rather than stabilized, since as a gasoline inhibitor the _____ derivative, being insoluble, doesn't even so much as contact the problem.

"To keep gum formation from getting a head start, I went out to our local warehouse at 4:30 A.M., loaded two 100-pound drums of flake Tenamene 3 in the trunk of my car, and took off with a little prayer that there were no loose nails in the road.

"There weren't, and I arrived at the customer's refinery at 9:00 A.M."

Normally, we move Tenamene inhibitor around the country by rail freight or truck transport. If possible we'd like to continue this practice. In an emergency, however, we're prepared to give our customers maximum personal service.

Sometimes, this personal service even includes personal delivery.

*Eastman's gasoline inhibitor grade of 2,6-ditertiary butyl p-cresol.

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West Coast: Wilson & Geo. Meyer & Company, San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

CHEVROLET

SEEN IN ALL THE WORST PLACES

They keep showing up in places most trucks can't get to because it takes an awful lot to stop these sure-footed Chevy four-wheel-drive models! Where the job calls for the mobility of a mountain goat teamed with the stamina of a mule, you'll find no finer way to get your work done. And for 1961 the Chevrolet 4-wheel drive lineup is a full dozen models long. You can pick from a *wide* selection—one that's sure to include the best answer to your toughest traction-plus requirement!

■ Put any one of these 4-wheel drive Chevies on any job—then watch it dig in and *go!* Come what may in the way of mud, snow, sand, loose gravel, creek bottoms, swampland or freshly plowed ground, you can rest assured that the extra bite of up to double traction—plus stump-jumping road clearance—will get you through every time.

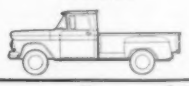
And you'll like the way a Chevy 4x4 rolls down the highway in smooth 2-wheel drive, ready to give you 4-wheel traction at the flick of a lever, the moment you need it. You'll appreciate the no-clutch shifting ease of the transfer case (whether moving or standing still) and the extra versatility that's yours with a choice of 4-wheel direct or underdrive.

If you prefer the extra snap of spirited V8 power, it's yours at nominal extra cost in any model. Also available at extra cost are heavy-duty 3-speed and 4-speed transmissions and a wide choice of traction tires. You can tailor your Chevy 4 x 4 to fit your needs exactly. Get the full details and turn your traction problems over to Chevy—the traction champ of them all!... Chevrolet Division of General Motors, Detroit 2, Michigan.

FLEETSIDE

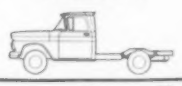
Model	Max. Load	Body Length
K1434	1400 lb.	6½′
K1534	1300 lb.	8′
K2534	2950 lb.	8′

STEPSIDE



Model	Max. Load	Body Length
K1404	1450 lb.	6½′
K1504	1350 lb.	8′
K2504	3050 lb.	8′

CHASSIS-CAB



Model	Max. Load	Wheel-base
K1403	1900 lb.	115″
K1503	1850 lb.	127″
K2503	3500 lb.	127″

PANEL CARRYALL

Model	Max. Load	Body Type
K1405	1300 lb.	7½′ Panel
K1406	1000 lb.	Carryall (panel type rear doors)
K1416	1000 lb.	Carryall (tailgate and liftgate)

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PLEASE SEND COMPLETE INFORMATION ON THE CHEVROLET 4-WHEEL DRIVE LINEUP TO:

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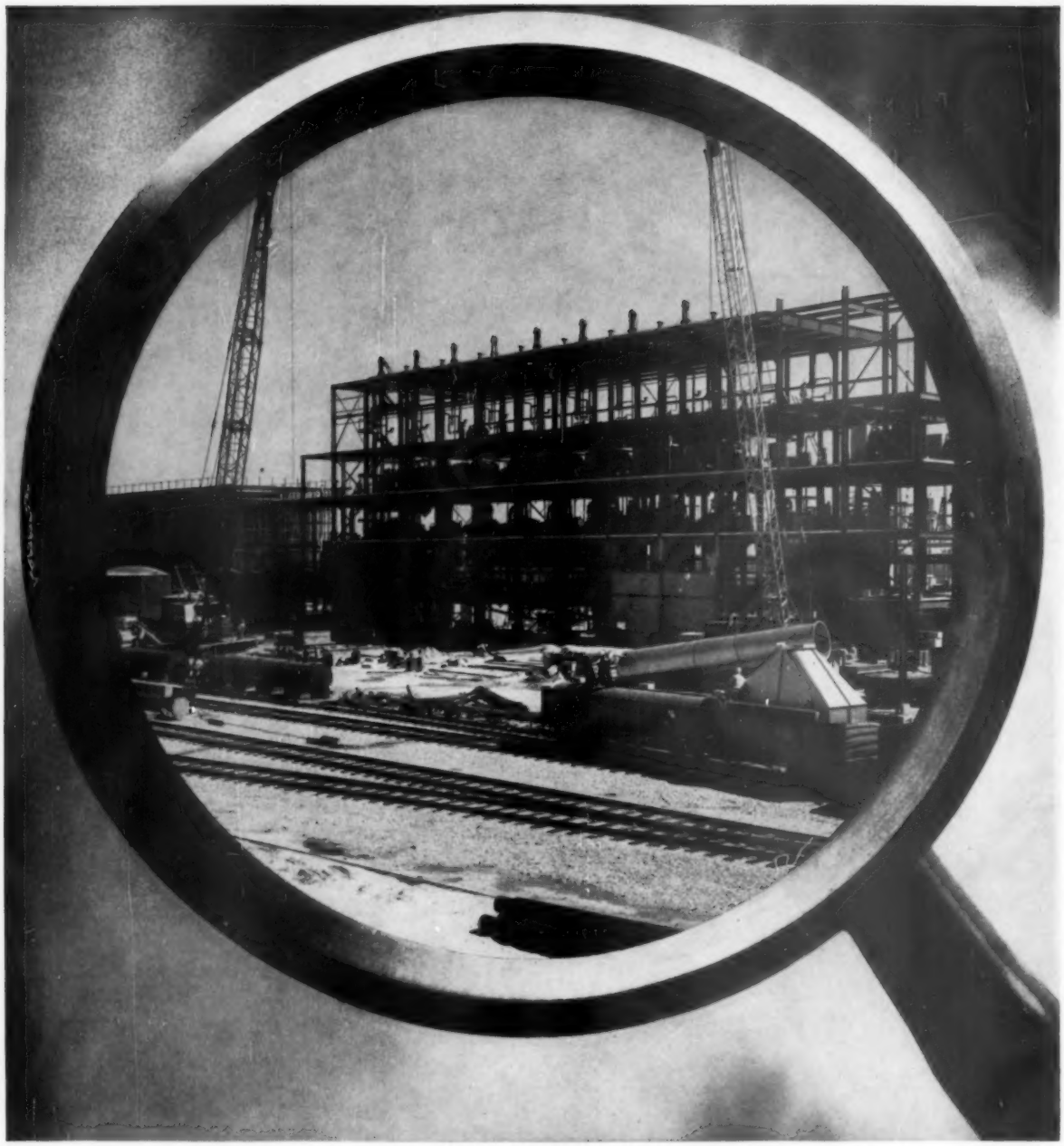
1961 CHEVROLET STURDI-BILT TRUCKS

CHEVROLET



FLASH! Beaumont, Texas: Houston Chemical makes the news with its new, multimillion dollar gasoline-additive plant, set to go on stream here in July—way ahead of schedule. This plant's output of tetraethyl and tetramethyl lead will make Houston Chemical the country's third largest producer of these additives. **Also included in the Beaumont petro-chemical complex will be an 80-million pound per year ethylene oxide plant—largest single unit of its kind ever constructed. This plant's glycol production will go into private label anti-freeze brands as well as bulk shipments. For further information, write Houston Chemical Corporation, 200 Madison Avenue, New York 16, New York.**

HOUSTON

HOUSTON CHEMICAL CORPORATION

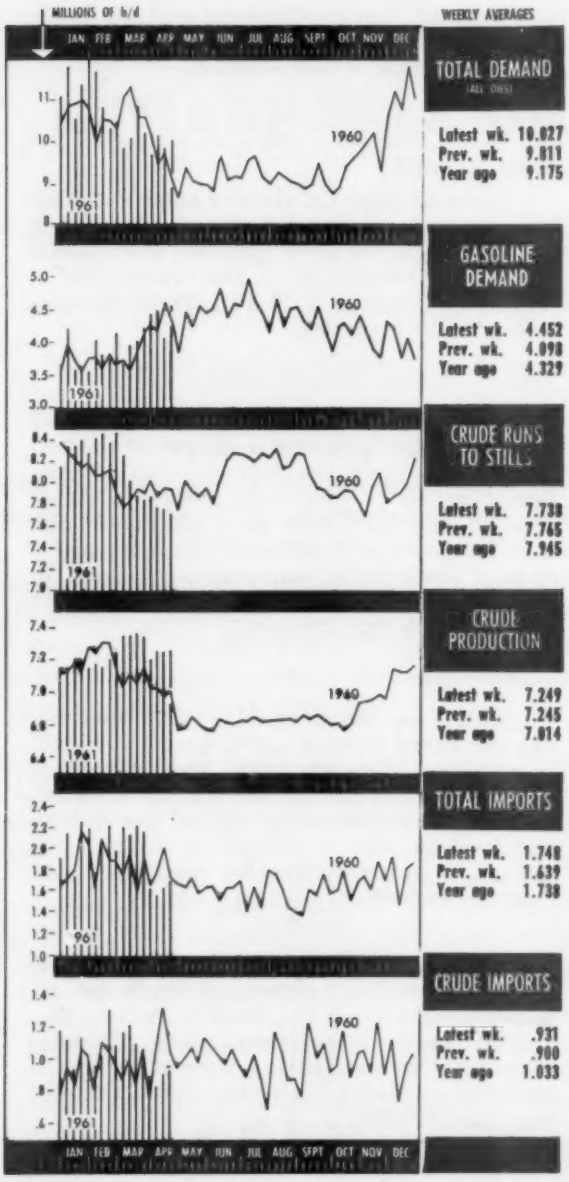
PETROLEUM WEEK'S Fingertip Figures

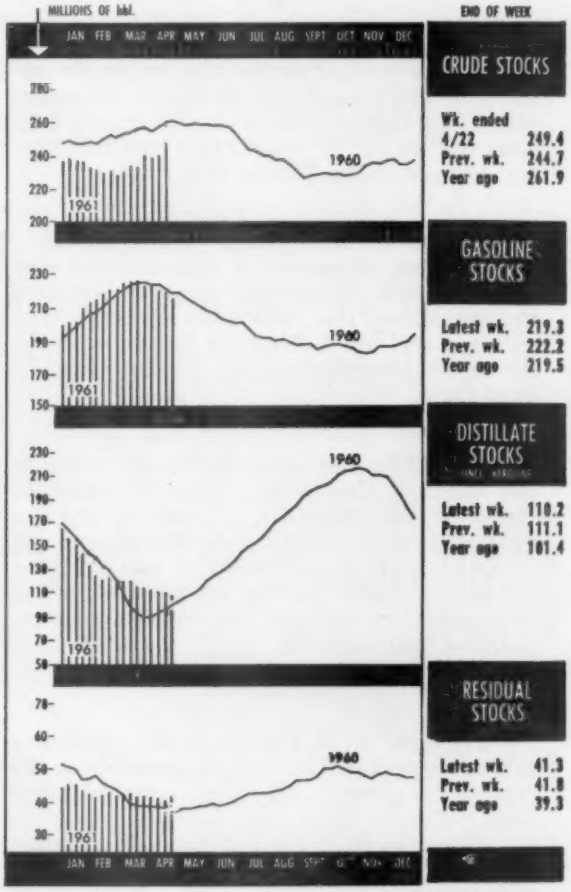
Total demand for the latest four weeks passed 1960's by 235,000 b/d. It averaged 9,914,000 b/d for the period, compared with 9,679,000 b/d a year earlier. The increase was due primarily to the strong out-of-season demand for distillates, which, averaging 4,435,000 for the four weeks, ran 646,000 b/d over the like period of 1960.

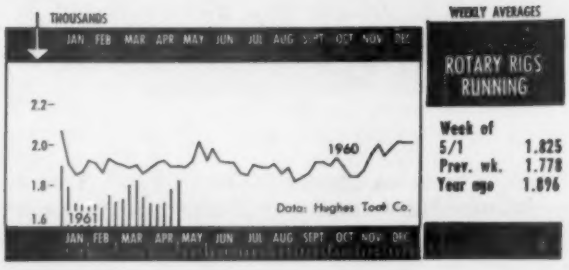
But gasoline demand is still pokey for this time of year. Demand for the four weeks averaged 4,309,000 b/d—trailing last year by 50,000 b/d.

Refiners are still cutting back on refinery runs, and the reductions are reflected in product inventories. Crude throughput was down 27,000 b/d last week, marking the third cut running. Gasoline stocks fell 2.9-million bbl. to 219.3-million bbl., 200,000 b/d under last year's level. Kerosine inventories dropped 221,000 bbl. and distillate 614,000 bbl.—both contraseasonal declines—while residual stocks were down 516,000 bbl. Crude inventories gained 4.7-million bbl. to 249.4-million bbl., compared with 261.1-million bbl. a year ago.

All figures below are for the week ended Apr. 28 unless otherwise noted.







Company Developments

Tube Turns Plastics, Inc., Louisville, Ky., is entering the field of halogenated plastics. The company, a pioneer in injection-molded thermoplastic piping products, plans to build a new plant at Dallas. Initial output will be products made of Du Pont's Teflon, a white fluorcarbon plastic resin. Tube Turns is an affiliate of Chemetron Corp., Chicago.

•

Fox Steel Pipe Corp., Birmingham, Ala., says orders for its gas line pipe are on the upswing in Florida and the Southeast. An example: The company says it has just received an order for 17 mi. of 6⅝-in. O.D. gas line pipe for delivery to the Tampa (Fla.) area.

•

The first shipments of plastic-coated pipe from the new Alton (Ill.) plant of Standard Pipeprotection, Inc., will start in June. The company will use X-Tru-Coat in its processing through a franchise obtained from Republic Steel Corp.

•

Sun Oil Co. has established a fellowship at the Harvard University Graduate School of Business Administration. It will be initially awarded in the academic year 1961-62, and will normally apply for a period of two years of full-time activity. The annual scholarship will be a maximum of $3,500, depending on the recipient's financial need.

•

Franklin Oil & Gas Corp. has adopted a new name that it feels more appropriate to the company's present operations—Franklin Oil Corp.

Since the disposition of its service station and gasoline distribution business, the company has devoted its facilities to the development, processing, and sale of a growing line of industrial metalworking lubes, rust preventatives, and special sanitation compounds for industrial, institutional, and building use.

•

Champion Chemicals, Inc., Odessa, Tex., is introducing a turnkey well-treating service to the Permian Basin area. The company's service is available anywhere in the Permian Basin on a regular basis—weekly, biweekly, monthly, or at any other interval required.

•

Nalco Chemical Co., Chicago, may build a plant to produce alkyl lead compounds. The company indicated that a Gulf Coast location would appear most practical and that the facilities would probably convert an estimated 26-million lb. a year of lead to alkyls.

•

Acquisitions

Ingersoll-Rand Co. plans to acquire Aldrich Pump Co. on a stock exchange basis. The boards of both companies have approved the consolidation, but completion of the transaction is subject to negotiation of an agreement satisfactory to both parties.

•

Stockholders of Atlas Powder Co. and Stuart Co. have approved a merger of the two companies. Atlas's board is expected to take formal action to make the merger effective around May 31. Stuart is a pharmaceutical manufacturer and distributor. When the merger is effected, Atlas will change its name to Atlas Chemical Industries, Inc., and split its common stock four for one.

•

Hutchison Manufacturing Co., Houston, has purchased Derrick Light, Inc., Ft. Worth, to provide a "broader base" for its lighting services. Derrick manufactures a line of vapor-proof lighting systems for oil and gas drilling and servicing rigs, floodlighting, electrical fittings, and wiring devices for the oil and construction industries.

•

CompuDyne Corp., Hatboro, Pa., has acquired two electronic automated weighing companies—TransWeigh Co., King of Prussia, Pa., and Automatic Measurement Corp., Phoenixville, Pa. The acquisitions were made on an exchange-of-stock basis, and the purchase price was over $500,000.

BULLETIN:

In case you missed it, the oil story your customers have been reading has been running in spreads and full pages in 1,340 newspapers. It is now repeated below and on the following pages.

It tells about the greatest motor oil advance since 10 W-30. And it has already talked to 43,383,000 readers. Marketers of Shell products are reaping the pay-off.

REMARKABLE OIL BREAKTHROUGH:

Suddenly Shell makes every other motor oil obsolete —with a revolutionary new formula which fights five internal troubles that can shorten engine life

Shell's research into engine behavior reveals five common internal troubles that can shorten the life of your car.

These troubles are additive ash, crankcase dirt, temperature changes, engine acid, and cooling system leaks. They all act silently and unseen.

Read how new Shell X-100® Premium Motor Oil prolongs engine life by fighting all five troubles—and why Shell scientists can make this unique promise.

TODAY, every Shell dealer in America has new Shell X-100 Premium Motor Oil ready for your Spring oil change.

New Shell X-100 Premium is a genuine scientific breakthrough because it is the only motor oil available that helps protect your car simultaneously against these five internal troubles that can shorten engine life.

Do you know what these troubles are? If not, you owe it to your engine to read this advertisement. Ten minutes' time *now* can save you hours of trouble in the future.

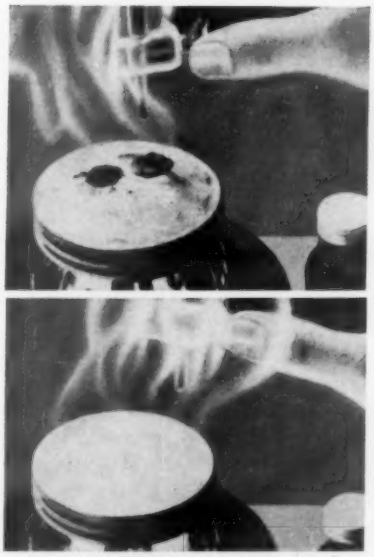
Trouble #1 —additive ash

Metallic ash is formed by the metallic additives which are used in all other multi-grade oils.

When allowed to build up, it can seriously affect your engine's performance—and can make it knock and run roughly.

New Shell X-100 Premium Motor Oil causes no such problems. Shell's revolutionary formula does not contain a single metallic additive.

No metal additives. No additive ash from motor oil. It's as simple as that.



Simulated hot piston test reveals freedom from additive ash. *At top:* conventional multi-grade oil leaves ash deposit. *Bottom:* the complete vaporization of X-100 Premium.

CONTD. NEXT PAGE →

Radioactive piston ring was used to test wear-reducing qualities of various motor oils. Such tests, plus those shown on other page aided development of X-100 Premium.

Trouble #2 —crankcase dirt

All engines accumulate crankcase dirt no matter how well they are protected by filters.

The problem is to stop this dirt from forming sludge which can clog your engine.

Most premium oils use a detergent additive to do the job. But, most detergents contain metals and cause ash.

Shell replaces detergents with a remarkable new ingredient known as a *dispersant*. Shell scientists call it Alkadine.*

Alkadine in new Shell X-100 Premium helps keep your engine clean by holding dirt particles apart. Thus they don't form sticky sludge. Some particles are trapped by the oil filter, some drained out when you change your oil.

Trouble #3 —temperature changes

Many motor oils tend to become too thick when cold and too thin when hot.

New Shell X-100 Premium with Alkadine puts a stop to extreme changes in viscosity and keeps its lubricant power throughout the most violent variations of season, weather and driving conditions.

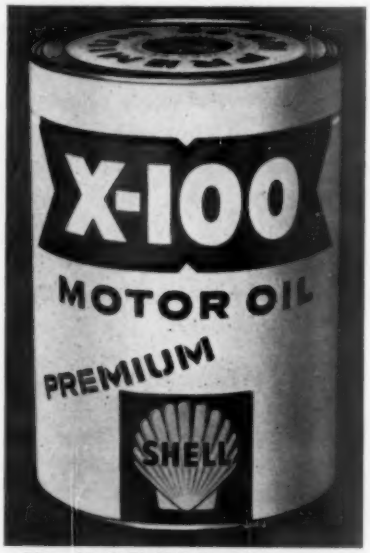
It is an all-year oil. Here's how it works. Once again the main secret is Alkadine. It happens to have molecular structure that resembles a basket of eels.

When Alkadine is cold, its eel-like molecules curl up as if for comfort. In effect, they take up less space in the oil—and the oil flows freely through the tightest bearing, even on cold nights.

Conversely, when the Alkadine in new X-100 Premium is hot, its molecules uncurl. They take up more room. And the oil resists thinning.

Trouble #4 —engine acid

All automobile engines manufacture acid. This can do far more damage than friction.



New Shell X-100 Premium — now making extra sales for Shell dealers.

One way to combat engine acid is to make the oil alkaline. Many oils use this method. But here's what happens.

The neutralizing effect of alkaline oil inevitably gets weaker and weaker as engine acid eats up the alkalinity—till it eventually stops working completely. When this happens, your oil no longer gives you the anti-acid protection that your engine requires.

Shell tackles this troublesome acid problem in a new and better way.

Thanks to Alkadine and other special nonmetallic additives, X-100 Premium actually plates all engine surfaces with a tough, thin chemical film.

In a chemical sense, the metal literally adsorbs some of Shell X-100 Premium's protective qualities. Our chemists call this interesting phenomenon "chemisorption."

"Chemisorption" offers a longer-lasting protection against acid attack than any other method so far invented.

Trouble #5 —cooling system leaks

Tiny leaks of permanent anti-freeze can react chemically with many oils and form a horrible sludge that can actually bring an otherwise healthy engine to a standstill. When this happens, you're on the way to a major repair bill.

New X-100 Premium sets all such fears at rest. It resists reaction with any sort of anti-freeze.

Do you pay more for X-100 Premium protection?

At most, Shell X-100 Premium costs less than a penny a day above the price of regular oil. Yet every drop of X-100 Premium is prolonging your engine's life by helping protect it from the five internal troubles listed above.

CONT. NEXT PAGE ➡

*Trademark

How Shell scientists tried to ruin $270,000 worth of cars to prove new Shell X-100 Premium

To prove and "wring out" new Shell X-100 Premium, Shell used a whole new fleet of ninety test cars. All stock models.

Shell test drivers drove over 5½ million miles under all kinds of conditions—and Shell X-100 Premium proved itself time and again.

If you are really interested in prolonging the life of your car, you should read the facts.

ARMED WITH their new $270,000 test fleet, Shell's test drivers had great fun.

They set out on a deliberate program of studied scientific brutality. Brutality to cars. Brutality to ordinary engine oils. Brutality to new Shell X-100 Premium.

When the drivers brought the cars back, Shell's scientists went to work.

Engines torn apart

They tore the engines down. Measured critical engine parts. Examined them for dirt and wear.

They even used radioactive tracers in a laboratory engine to study the effectiveness of new Shell X-100 Premium.

Here are six of their findings. They make good reading for anyone who wants to prolong the life of his car.

1. Engine wear was minuscule. One car, lubricated with new Shell X-100 Premium, still had the tool marks on its piston rings after seventy thousand miles. No motor oil can lubricate better than that.

2. Cleanliness ratings were exceptional. Shell X-100 Premium's average rating for lacquer was 9.5 out of a perfect score of 10. A score of 9 is considered to be excellent.

3. Rumble, that strange new phenomenon, was curtailed with Shell X-100 Premium.

Rumble is a sort of baritone knock. It afflicts high-compression engines especially, causing an eerie and dangerous vibration.

Rumble is usually caused by combustion chamber deposits that make the fuel-air mixture explode prematurely. Shell X-100 Premium goes to the heart of the problem. It refuses to create new deposits.

In one rumble test, Shell X-100 Premium allowed a high-compression engine to develop 22% more rumble-free power than an engine lubricated with ordinary oil. Shell X-100 Premium was 6% better on rumble than even expensive labo- tory "reference oils."

4. Wear on cylinders and rings was scarcely detectable on cars using Shell X-100 Premium.

After an amazing 120,000 miles at racetrack speeds, one powerful eight-cylinder engine showed only .0002 inch cylinder wear per 10,000 miles.

5. Oil consumption with Shell X-100 Premium was a real cause for cheers.

The average consumption for 9 cars driven at 60 mph to 100 mph for *one hundred thousand miles* was only one quart for every 1,800 miles.

6. Sludge in crankcases lubricated with Shell X-100 Premium was reduced to almost *half* the amount lubrication experts consider acceptable.

And that's just six findings out of a thousand facts—all of which prove that new Shell X-100 makes every existing motor oil obsolete.

Don't you think it's high time you changed to Shell X-100 Premium? If so, here's the best way to do it.

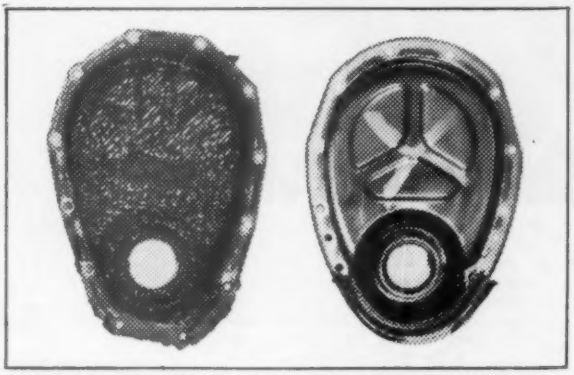
1. Drive your car until the engine is thoroughly warm.

2. Ask your Shell service man to drain your oil while it is hot. Also make sure to tell him to replace the old oil with new Shell X-100 Premium. It comes in a distinctive *white can.* Check this point.

No other premium oil will give you the same sort of protection.

3. If your car has an oil filter, have the filter cartridge changed, too.

This will remove some of your engine's old dirt and contamination.



The sticky mess at left is sludge. The test car was lubricated with ordinary oil. A part from another car is shown at right. This car had the same number of oil changes, but Shell X-100 Premium kept the dirt dispersed so it has drained out with the oil.

4. Have your air filter element cleaned or replaced also. It's a simple job. And it helps prevent further unnecessary contamination.

And that's all there is to it. A few extra minutes in your Shell service station. A few extra pennies for a refill with new Shell X-100 Premium. And your reward, as these tests verify, can be longer engine life.

Look at it any way you please. Shell X-100 Premium Motor Oil is quite a bargain.

SHELL

A BULLETIN FROM SHELL RESEARCH

—where 1,997 scientists are working to make your car go better and better.

WILLIAM S. DAVIS is the new president of Harrisburg, Inc., Oil Field Sales & Service, Houston, manufacturer and distributor of diamond-hard products and oilfield equipment. Davis joined Harrisburg last year after ten years of employment with other companies of Kendavis Industries, Inc., International.

W. S. Davis

A. C. Brodie

A. C. BRODIE is the new assistant to the president of Badger Mfg. Co., Cambridge, Mass. He joined the company in 1957, and has been primarily involved in its foreign activities. Brodie has also been vice-president of Feedback Controls, an electronics company.

DONALD A. STOLZMAN is Midwest district manager at a new Chicago office opened by Centriline Corp. The company, a subsidiary of Raymond International, Inc., specializes in rehabilitating and lining pipelines. Stolzman was formerly associated with Koppers Co.

GENE R. SHERROD has been appointed manager of sales and public relations for S.I.P., Inc., Houston engineering and construction company. Sherrod was formerly a staff member of the Independent Petroleum Assn. of America.

NORMAN H. PETERSON, formerly advertising manager for Timken Roller Bearing Co., Canton, Ohio, has been appointed assistant to Timken's president. **John H. Fellows,** formerly sales promotion manager and manager of college relations, succeeds Peterson.

THOMAS J. WELLY has been appointed manager of corrosion protection products sales for Owens-Corning Fiberglas Corp., Toledo, Ohio. He was formerly advertising supervisor for the Fiberglas sales-to-manufacturers division. In his new position, he will be in charge of Fiberglas pipeline wraps for underground production and Fiberglas reinforced plastic anticorrosion products, including pipes and tanks.

P. M. HENRY, R. E. EDDY, and **ORELL COLLINS** have been promoted to industrial division district managers for Nalco Chemical Co., Chicago. Henry, formerly a district representative in the Pacific Northwest, moves up to the Mid-South district, with headquarters in Knoxville, Tenn. Eddy, formerly product manager for Nalco's papermaking chemicals department in Chicago, takes over the Southeastern district, with offices in Jacksonville, Fla. Collins, who has been area manager in Nalco's Texas district, heads the newly created South Atlantic district, with offices in Charlotte, N.C.

ROBERT L. SMITH is the new manager of sales promotion for Bucyrus-Erie Co., South Milwaukee (Wis.) manufacturer of construction, drilling, and mining equipment. He has been a sales representative for the company's Chicago regional office for the past six years. During that period, he represented the company in the Detroit area and other midwestern territories. In his new position, Smith will be in charge of Bucyrus-Erie's publicity, advertising, publications, sales literature, and other sales aids.

BILLY CRICE is in charge of the new Woodland (Calif.) location opened by Welex, a division of Halliburton Co. Crice, a sales engineer, was formerly located at the division's Bakersfield (Calif.) district.

T. O. Carson

D. H. Shoemaker

THOMAS O. CARSON moves up to assistant vice-president, meter and valve division sales, for Rockwell Mfg. Co., Pittsburgh, and **D. H. SHOEMAKER** succeeds him as manager of the meter and valve division's central region, also in Pittsburgh. Shoemaker will be responsible for coordinating the division's sales east of the Mississippi. He was formerly Pittsburgh district manager for the division.

W. O. COOK and **GORDON G. WILBUR** have been named co-managers for Ideco Division, one of the Dresser Industries, in Dallas. Cook, a senior vice-president, was most recently in charge of engineering and manufacturing at Ideco's plant at Beaumont, Tex., and Wilbur, a vice-president, was formerly assistant to Ideco's president, in Dallas, and had responsibility for export sales.

ROSS BREWER moves up to district manager for a new Garrett sales and service office in Odessa, Tex., opened by Axelson-Garrett, division of U.S. Industries, Inc. Brewer was most recently sales engineer in Houston. **Lowell Stell** has been named district manager for the Garrett office in Hobbs, N.M., which serves eastern New Mexico and West Texas. This area was recently reorganized to provide expanded sales and service in the Permian Basin area.

FRANK F. ROSS and **I. M. DEARING, JR.,** are new sales engineers for Grove Valve & Regulator Co., Oakland, Calif. Ross will be located in Pittsburgh, Pa., and Dearing in Lafayette, La. Ross was formerly division sales representative for National Supply Co., Houston, and Dearing was a sales representative for Oil Center Tool Co., Houston.

G. A. Hays

K. Chickering

GEORGE A. HAYS has been named assistant vice-president, solicitation, for the Oil Well Supply Division of U.S. Steel Corp., Dallas, and **KENTON CHICKERING** has been named director of marketing services for the division. Hays will be responsible for customer solicitation and trade relations, and coordination of sales activities; Chickering will be responsible for various sales and supporting staff activities including advertising, market development, and commercial research. Hays was director of Oilwell's product sales. Chickering has been staff manager of the general sales department.

ERWIN WASEY, RUTHRAUFF & RYAN, INC. will handle advertising, merchandising, and sales promotion for Gulf Oil Corp.'s petroleum specialty products. The agency already handles Gulf's eastern hemisphere advertising through its Pittsburgh and London offices. Specialty products will be handled in Pittsburgh.

DOUGLAS MUELLER will become director of public relations and advertising for Borg-Warner Corp., Chicago. He was most recently director of merchandising and public relations for Seiberling Rubber Co., Akron, Ohio, and before that was assistant to its president. Mueller will direct Borg-Warner's public relations and advertising activities.

RALPH E. STEVENS has been appointed product sales manager for oil production equipment, and **J. E. BYERS** product sales manager for gas process equipment, for Black, Sivalls, & Bryson, Inc., Kansas City, Mo. Both men have been with BS&B in line sales management.

CHARLES C. MABRY has been appointed manager of the Kilgore (Tex.) store of National Supply Division, Armco Steel Corp. He was most recently district salesman for National Supply at Tyler, Tex.

PRODUCT IMPROVEMENT WITH

PETRECO

EFFICIENT DESALTING is the first step toward PROFITABLE REFINING

Salt removal is now a routine operation in all modern refineries. With the need for effective desalting widely recognized, the main problem today is the selection of that equipment which will do the most efficient job at the least possible cost.

When you need new or additional desalting facilities, keep these points in mind:

■ ***The first electric desalter was designed and installed by Petreco engineers.***

This was nearly a quarter of a century ago. The subsequent years of solid, practical experience in dealing with (and solving) desalting problems all over the world now enable Petreco desalting to yield salt removals in the 98-100% range. The fraction of a cent per barrel desalting cost is saved many times over by the gains in refining efficiency resulting from a clean charging crude.

■ ***The first chemical desalter was designed and developed by Tretolite engineers.***

Tretolite chemical formulations were the first ever to be used in desalting. Tretolite desalting units are the only exclusively chemical desalters ever to be sold and installed in the refining industry and are currently used to desalt a million and a half barrels per day. In fact, every important development in crude oil desalting has resulted from the Petrolite research, engineering and development program.

YOU GET

98-100% SALT REMOVAL

WITH PETRECO ELECTRIC OR

TRETOLITE CHEMICAL DESALTING

Because Petreco offers both kinds of desalters, the company has no "axe to grind". This means that you get an honest and objective appraisal of the method best suited to your operation.

There is no other desalting equipment on the market today that can offer you comparable efficiency of design. The operating records from installations around the world *prove* it! There's no other company, either, that can offer you Petreco's fund of desalting technology or Petreco's rich background in this highly specialized field.

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ITALY, Rome • JAPAN, Tokyo • KUWAIT, Kuwait • MEXICO, Mexico, D. F.

NETHERLANDS, The Hague • PERU, Talara • TRINIDAD, Port of Spain

WILLIAM J. ZEMAN has been elected vice-president, general counsel, and a member of the executive committee of Phillips Petroleum Co., Bartlesville, Okla. He succeeds **Rayburn L. Foster,** who is retiring after 32 years with the company. Zeman was elected a director of the company earlier this year. Zeman, who joined the company in 1942, has been general attorney since 1959.

W. J. Zeman

J. G. McNab

DR. JOHN G. McNAB has been appointed to the newly created position of chairman of new uses activities for Standard Oil Co. (N.J.), New York. He was formerly deputy to the vice-president for petroleum products, medical, basic, and analytical research for Esso Research & Engineering Co. His appointment is a part of Jersey's efforts to develop new uses for petroleum and to increase consumption of existing products. McNab will be responsible for the stimulation and coordination of research and investigative efforts in these fields by Jersey affiliate companies throughout the world. He will also serve as chairman of Jersey's recently established new uses advisory committee.

VAN THOMPSON has been elected president of Aztec Oil & Gas Co., Dallas, succeeding **Wofford Cain,** who becomes chairman. Cain was elected president in 1954, and Thompson became executive vice-president and a director at the same time. **Edward M. Anderson,** chief geologist for Aztec for the past seven years, has been elected vice-president in charge of production.

STANLEY D. BREITWEISER, DX Sunray Oil Co., Tulsa, was elected vice-president of the Western Petroleum Refiners Assn. at its annual meeting last week. Newly elected directors of WPRA are: **C. H. Barre,** Plymouth Oil Co., Pittsburgh; **W. K. Davis,** Premier Oil & Refining Co. of Texas, Longview; **J. L. Nolan,** Farmers Union Central Exchange, St. Paul, Minn.; **S. S. Seltzer, Jr.,** Southwestern Oil & Refining Co., Corpus Christi; and **Edwin Singer,** Pontiac Refining Corp., Corpus Christi.

DWIGHT E. HUTH moves up to assistant superintendent of Continental Oil Co.'s Ponca City (Okla.) refinery. He was formerly superintendent of the catalytic cracking division there. In his new position, Huth will be in charge of the catalytic and thermal cracking divisions. He succeeds **L. S. Burke,** who has been named operations superintendent of the Panama refinery now being constructed by Refineria Panama S.A., a Conoco affiliate.

REX D. STRUBLE has been named manager of Atlantic Refining Co.'s methods and standards department, with offices in Philadelphia. He succeeds **Thomas E. Kelly,** who has retired after 26 years with the company. Struble was most recently manager of the producing division of the methods and standards department. He joined Atlantic in 1960, after 20 years in the U.S. Air Force.

G. W. Woods

D. G. Clark

DONALD G. CLARK has been appointed vice-president, sales, for Trans-Canada Pipe Lines, Ltd., Toronto, and **GEORGE W. WOODS** has been appointed vice-president and treasurer. Woods joined Trans-Canada in 1959 as treasurer, and Clark joined the company last year as manager of gas sales. Before that, Clark was vice-president of Allied Oil Co., a division of Ashland Oil & Refining Co.

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1375 Peachtree St., N.E.
Trinity 5-0523

Boston 16 — David G. Sawyer
Copley Square
Congress 2-1160

Chicago 11 — Edward A. Callahan Jr.
520 N. Michigan Avenue
Mohawk 4-5800

Cleveland 15 — Marcus A. Loy, Jr.
55 Public Square
Superior 1-7000

Dallas 1 — James R. Pierce
1712 Commerce Street
Riverside 7-9721

Denver 2 — J. W. Patten
Tower Bldg., 1700 Broadway
Alpine 5-2981

Detroit 26 — Merritt Hulburd
856 Penobscot Bldg.
Woodward 2-1793

Houston 25 — D. O. Hanson
724 Prudential Bldg.
Jackson 6-1281

Los Angeles 17 — Peter S. Carberry
1125 W. Sixth St.
Huntley 2-5450

New York 36 — David G. Sawyer
500 Fifth Ave.
Oxford 5-5959

Philadelphia 6 — H. Sherman Davis
6 Penn Center Plaza
Locust 8-4330

Pittsburgh 22 — Marcus A. Loy, Jr.
4 Gateway Center
Express 1-1314

Portland 4 — Scott Hubbard
Room 445, Pacific Bldg.
Capital 3-5118

San Francisco 11 — Peter S. Carberry
255 California St.
Douglas 2-4600

Tulsa 3 — J. A. Hartley
522 South Boston
Luther 7-5594

England, London E. C. — E. E. Schirmer
McGraw-Hill Publishing Co., Ltd.
34 Dover St.

Germany, Frankfurt/Main — S. Kimes
85 Westendstrasse

Switzerland, Geneva — M. R. Zeynel
2 Place du Port

P. M. KONKEL, assistant chief geologist at Ohio Oil Co.'s domestic production headquarters at Findlay, Ohio, will become division geologist in the company's expanded Tulsa production division. The company has recently consolidated its Shreveport production division with the production division in Tulsa. Konkel, who joined the company in 1940, has also served as a geologist at Marshall, Ill., and at Houston. At the same time, **R. K. Bowles** and **R. A. Koenig** were named senior staff geologists in the new Tulsa division. Bowles has been division geologist at Tulsa, and Koenig division geologist at Shreveport. **G. R. Baldwin,** Shreveport division landman, will become division landman, and **R. J. Grubb,** now acting Tulsa division landman, will become assistant division landman. **D. W. Akins, Jr.,** Shreveport division petroleum engineer, will join the Tulsa staff in the same capacity. **F. V. Kluck,** now division petroleum engineer at Tulsa, will become assistant Tulsa division petroleum engineer.

P. M. Konkel

W. B. Hopkins

W. B. HOPKINS, formerly production manager for Gulf Oil Corp.'s New Orleans production district, transfers to the production department at Gulf's general office in Pittsburgh. **J. L. Coulson,** now assistant district production manager at Gulf's Midland (Tex.) district, will succeed Hopkins in New Orleans. **E. E. Merkt, Jr.,** currently manager of the Midland production district, will be transferred to Mene Grande Oil Co., Gulf's Venezuelan affiliate. **H. B. Leeton,** now production manager at Midland, succeeds Merkt, and **E. D. Brake,** district production manager in Denver, succeeds Leeton. **C. L. Borland, Jr.,** area production manager at Sand Hills, Tex., moves up to district production manager at Denver. **W. L. Merrill,** now assistant production manager in Oklahoma City, succeeds Borland.

EVERETTE A. SKARDA is the new general manager of Dansk Veedol, Tidewater Oil Co.'s Danish subsidiary, succeeding **George M. Dixon,** who is returning to a new assignment with Tidewater in the United States. Skarda has been zone manager of Getty Oil Co.'s Saudi Arabia-Kuwait natural zone operations for the past four years.

JOHN J. CULLEN is the new manager of operations for California Oil Co.'s refining department, in Perth Amboy, N.J. He succeeds **E. J. Karle,** who has been named vice-president of the company's eastern division. Cullen, who joined the company in 1947, was most recently general superintendent of the Perth Amboy refinery.

LOWELL STANLEY has been elected chairman of Petrolane Gas Service, Inc., Long Beach, Calif., marketer of LPG. He succeeds **P. E. Foote,** who has been appointed honorary chairman. Stanley, a director of Petrolane since 1942, is also a director of Beckman Instruments, Inc., and chairman of the economics advisory committee of the Mid-Continent Oil & Gas Assn. He was formerly chairman of the board and chairman of the executive committee of Monterey Oil Co., Los Angeles.

E. B. DUNN, Atlantic Pipe Line Co., Philadelphia, has been elected president of the Petroleum Industry Electrical Assn. He succeeds **C. E. Upsom,** Natural Gas Pipeline Co. of America, Chicago, who becomes chairman of the association's board.

W. J. Sheridan

J. J. Coates

R. B. Winkel

WILLIAM J. SHERIDAN, JOHN J. COATES, and **ROBERT B. WINKEL** have been named to new positions as managers of three Humble Oil & Refining Co. refineries. Sheridan will be manager of the Bayway refinery, Linden, N.J., succeeding **G. Ross Murrell,** who has accepted a position with another Standard Oil Co. (N.J.) affiliate, Standard Vacuum Oil Co. Coates succeeds Sheridan as manager of Humble's Everett (Mass.) refinery, and Winkel succeeds Coates as manager of the company's Pittsburgh grease manufacturing plant. Winkel was formerly operations superintendent at the Bayonne (N.J.) refinery.

SEARCHLIGHT SECTION

(Classified Advertising)

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Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Exploration personnel and oil operators

THE STRUCTURAL MAP OF THE MIDCONTINENT

by Dr. R. R. Wheeler, Meadows Bldg., Dallas 6, Texas

Brochure on request

LOOKING FOR A CHICAGO TERMINAL?

Ideal site for your chemical or petroleum bulk storage—River front location

Railroad spurs

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Will build to suit—Send for our illustrated booklet—

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RETAIL SALES MANAGER—Independent oil company; management of bulk sales plants, commission agents, service station acquisition and supervision; must have prior experience with oil company in these activities; age 30-35; BBA or liberal arts degree preferably with major in marketing and/or accounting. Will be based in Virginia, but must be willing to travel; excellent employee benefits; salary commensurate with ability and experience. **Send detailed resumé of education, experience and qualifications to P. O. Box 1097, Houston 2, Texas.**

BUSINESS OPPORTUNITY

Yuma County Arizona-Big Oil Leasing activity. 5 year state leases. Rent 25¢ acre. Investigate. 430 16th St., Suite 409, Denver 2, Colorado.

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—for you—the advertiser—and the publisher, if you mention this publication. Advertisers value highly this evidence of the publication you read. Satisfied advertisers enable the publishers to secure more advertisers and—more advertisers mean more information and more products or better service—more value— to YOU.

A Farewell From Petroleum Week

THE EDITORS OF PETROLEUM WEEK are extremely fortunate to have made so many friends in the petroleum industry. Six years is a relatively short span. To you, our audience, it is our sincere hope that we made some mark in the industry.

As editors, we dedicated our efforts to serving the petroleum industry with factual information. On this page we discussed the rights and wrongs as we saw them. We had an ax to grind: Our conviction was—and is—that the petroleum industry, made up of thousands of highly competitive entities, needs a lot of advice from interested, but arms-length, observers. It may need more of it in the future.

We are proud that so many oil men sought our advice. And we appreciate the counsel given us. Certainly in an industry that is as uniquely complex as oil, no one knows all the answers. The industry's constant battle with the economic facts of life proves that.

The future holds great promise for the suppliers of the nation's primary energy. There will be as many changes to come as there have been in the past.

As have the old-fashioned wooden derricks, the steam donkey engines, the pot-belly stills, the horse-cart kerosine vendors, and the tall gasoline hand pumps, the modern PETROLEUM WEEK has passed from the scene.

We are happy to have been part of a fast-moving industry.

— 30 —

electron micrograph shows why Slick Water reduces pumping horsepower losses during well treatments

This electron micrograph shows an 11,000-time magnification of the polymer in Slick Water*, Dowell's friction-reducing agent for water. Agents providing a similar effect are also available for oil and acid. ☐ Notice the structure of the polymer. It is believed that the polymer confers an elastic behavior which suppresses the usual turbulence of fast-flowing fluids. This action saves much of the energy lost by random turbulent motion and reduces friction in the pipe.

This means lower fluid friction and greater pumping efficiency

What can Slick Water do for you? It all depends on your well and your treatment requirements.

In some cases, it means that you may need only one pump truck instead of three for fracturing or acidizing. You pocket the saving!

In some cases, it may mean that you can get the benefits of high-injection-rate fracturing without having to pull tubing.

In other cases, it may mean that you can attain desired injection rates, yet stay within the pressure limit set by the strength of the casing.

In still other instances, it may mean that you can perform larger, higher-rate treatments and profit from bigger production increases.

And sometimes, it may mean that you can use a lower cost fluid – again reducing treatment costs.

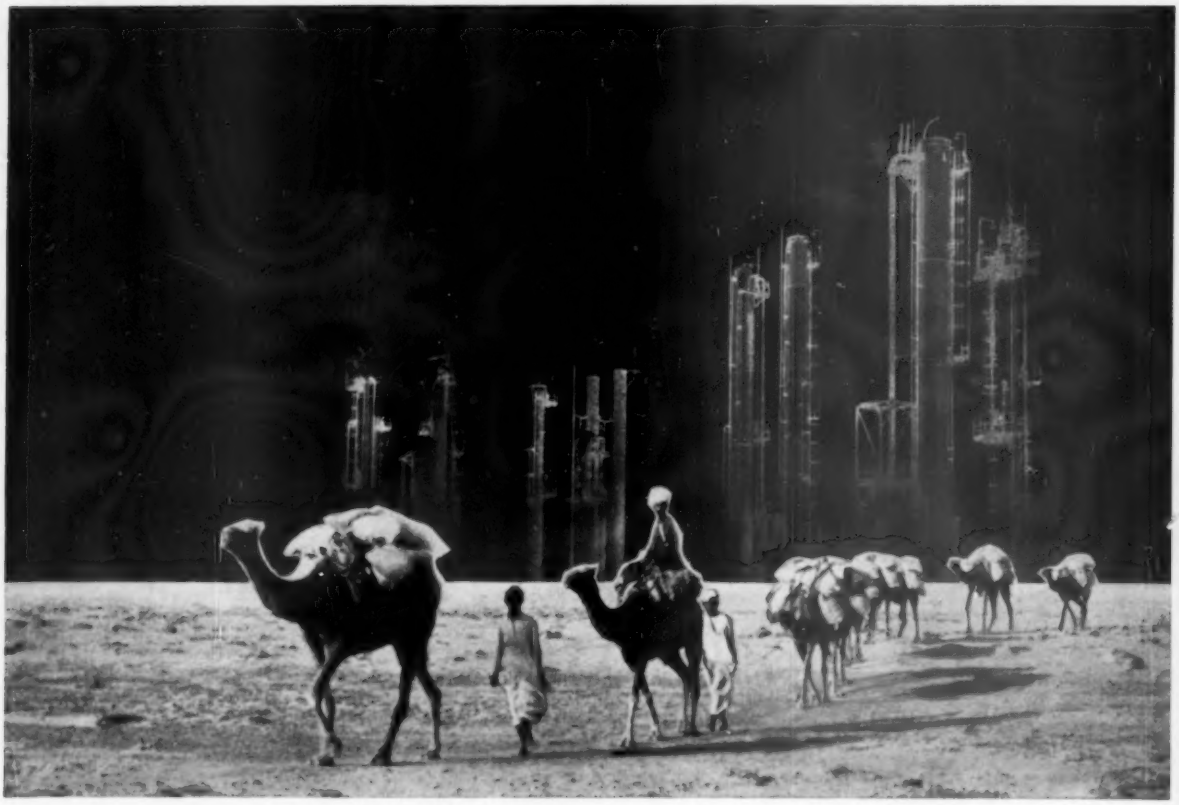
Dowell friction-reducing agents have helped operators get lower treatment costs and greater production increases. Ask your Dowell representative for more information. Dowell services and products are offered from more than 150 offices and stations in the United States, Canada, Venezuela, Argentina, Germany, France and the Sahara area. Dowell, Tulsa 1, Oklahoma. *DOWELL TRADEMARK

SERVICES FOR THE OIL & GAS INDUSTRY

DOWELL

DIVISION OF THE DOW CHEMICAL COMPANY

MAKING A MIRAGE MATERIALIZE



PAKISTAN'S FIRST OIL REFINERY TO BE BUILT BY KELLOGG

for British-Dutch-American consortium

Engineering is well under way at Kellogg for Pakistan's first refinery, near Karachi. Simultaneously, details of procurement—a world-wide operation—are being planned in Kellogg offices. As reported previously, construction is scheduled to begin later this year.

The Kellogg organization will be completely responsible for this 35,000 BPD refinery to Pakistan Refinery Limited. The Burmah Oil Company, Caltex, Shell, and Stanvac all participate in Pakistan Refinery Limited. Technical coordinator for the consortium is Bataafse Internationale Petroleum Maatschappij.

Important considerations in the selection of the Kellogg organization were cost, speed, ease of maintenance, and the proved ability to undertake and coordinate every phase of engineering, procurement, and construction. Kellogg's contract assures the minimum initial investment and operating costs consistent with good refinery practice and proper safety standards.

For companies considering oil refining or petrochemical manufacturing facilities overseas, Kellogg's international organization offers the optimum return on investments and the soundest kind of economic aid to friendly nations.

THE M. W. KELLOGG COMPANY

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